Negative *wh*-quantifiers in Cantonese: a syntactic proposal and an investigation of adult English-Cantonese interlanguage

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Abstract

This thesis is a two-fold research project looking at the syntactic account and second language (L2) acquisition of the colloquial Cantonese negative *wh*-quantifiers (Neg-whQ). I propose a (Neg-*wh*)QP structure accounting for Neg-whQs (e.g. *mou-bingo* 'nobody', *mou-matje* 'nothing' and *mou-bindou* 'nowhere'), which are composed by the negative morpheme *mou,* an unpronounced quantifier operator Ø and a *wh*-phrase. Thus, a Neg-whQ inherits [Neg] and [Quant:_] features. While SVO is the canonical word order in Cantonese, Neg-whQ observes the exceptional SOV structure. This study aims to provide a feature-based approach to explain the overt movement phenomenon Neg-whQs embody which accounts for the dual interpretation of Neg-whQ$_{obj}$ constructions, the negative and existential '*only a few'* readings. In addition, this study fills the gap and looks at the little studied L2 acquisition of Neg-whQs in Cantonese by adult English speaking learners. In the absence of a one-to-one morphological mapping between English Neg-whQs (e.g. *nowhere*) and Cantonese Neg-whQs, this study investigates claims from previous studies (Slabakova, 2006, 2008, 2010) about problems with the functional morphology in L2 acquisition. The ambiguity arises from a scrambled doubly quantified sentence at syntax-semantics interface is considered a poverty-of-the-stimulus (POS) problem (Schwartz and Sprouse, 2000) since the relevant facts are underdetermined by L2 learners' first language (L1) grammar and the L2 input. The L2 study is manipulated to test learners' acceptance of the SOV structure regarding Neg-whQ$_{obj}$ constructions and their ability to fully understand the implied meanings of Neg-whQs. The findings support Slabakova's bottleneck hypothesis that Neg-whQs pose a challenge to L2 learners and delay L2 acquisition of overt movement and interpretations at morphology-syntax and syntax-semantics interfaces. However, individual advanced L2 learners overcame the POS problem and showed native-like competence of Cantonese Neg-whQs. Thus, Schwartz and Sprouse's (1994, 1996) Full Access of the Full Transfer/Full Access model is also supported.

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Author's Declaration

This thesis has not been published before, and has not been submitted in candidature for any degree apart from Doctor of Philosophy of the University of York. This work is entirely original and contains no borrowings from other works. In addition, the results of the experimental works conducted are from my own investigation.

An earlier version of the syntactic proposal (of Chapter 3) was presented at the Sixth Cambridge Postgraduate Conference in Language Research, on the 7-8th December 2010, and the Third Conference of the University of Kent's CLLS Interface Series, on the 4-6th May 2011 in England; and published in *Proceedings of the Sixth Cambridge Postgraduate Conference in Language Research* (2011: 92–107) and *Interfaces in Language 3* (2013: 31–54).

Parts of this work was presented and published elsewhere. Bits of Chapter 3, was presented at Linguistics Beyond and Within International Linguistics conference in Lublin, on the 14-16 November 2013, and the proceedings of the conference was published in *Within Language, Beyond Theories (Volume I): Studies in Theoretical Linguistics* (2015: 98–115); bits of Chapter 5 (results of the 2nd pilot study), was presented at the Sixth Language at the University of Essex Postgraduate Conference, on the 15-16th June 2011, and paper presented was published in *Language at the University of Essex (LangUE) 2011 Proceedings* (2012:68–83); bits of Chapter 6, was presented at the eighth Newcastle-upon-Tyne Postgraduate Conference in Linguistics, on the 5th April 2013, at the 5th HAAL conference (Hong Kong Association for Applied Linguistics in HK), on the 7th June 2014, and at the 33rd annual Second Language Research Forum (SLRF 2014), on the 23-25th October 2014 .

CHAPTER 1

INTRODUCTION

This dissertation presents two perspectives on the little-studied negative *wh*-quantifier (Neg-whQ) construction in Cantonese, exemplified in (1–2).

1. mou-matje
   no-what
   'nothing' / 'only a few things'

2. mou-bingo
   no-who
   'no-one' / 'only a few people'

First, a syntactic account is proposed for the dual interpretation of Neg-whQs evident in (1–2). Second, an experimental investigation is undertaken of how the syntax and semantics of these constructions are acquired in second language (L2) Cantonese.

Neg-whQs are a type of *wh*-quantifier, in which their morphological composition involves the combination of a negative morpheme *mou* and a *wh*-phrase. Neg-whQs have both non-existential and existential presupposition interpretations and are typical colloquial terms in Cantonese. Example (3) illustrates a Neg-whQ$_{obj}$ construction with a neutral sentence particle (SP).

3. Ngo *mou-matje* zungji wo3.
   I no-what like SP
   a. 'I like nothing.'
   b. 'I only like a few things.'

Chapter 2 focuses on the discussion of *wh*-phrases as a crucial component of Neg-whQs in forming them as *wh*-quantifiers. The favoured *wh*-operator movement and particular contexts licensing *wh*-phrases as indefinites and negative propositions are also discussed to lay a fundamental background to the syntactic proposal to Neg-whQs in this thesis. We will see the difference between negative quantifiers in English and Neg-whQs in Cantonese is comparable to the difference between *wh*-phrases/words in English and Cantonese. Unlike *wh*-words in English, the [+/-Q] feature of Cantonese *wh*-words is morphologically realized through elements in other parts of the sentence but not as a part of the *wh*-word itself. That is, *wh*-words in Cantonese bare an unvalued (uninterpretable) [Q] feature and also [*u*Quant] which could possibly license them as indefinites (e.g. existential quantifiers, universal quantifiers, etc.). Throughout this thesis, we will consider three features throughout: [*u*Quant:_], [Quant:_] and [Neg] of Neg-whQs.

4. Basic Structure of a Neg-whQ:

(Neg-wh)QP$_{\text{[Neg, Quant:_]}}$

Mou$_{\text{[Neg]}}$ Quant'

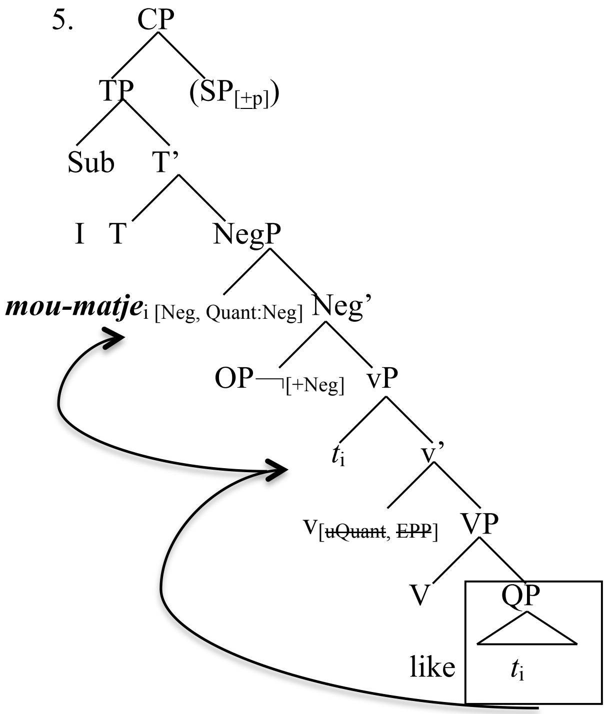
Quant whP

Ø$_{\text{[Quant:_]}}$ ***bingo*** [~~uQuant:_~~]

In Chapter 3, I propose a (Neg-*wh*)QP structure in representing the complex internal structure of a Neg-whQ, in which *mou* is the specifier, an invisible quantifier operator Ø is the head and any *wh*-phrase is the complement as in (4). This structure grants Neg-whQs an internal quantifier operator Ø which bears a [Quant:_] feature, giving quantificational force to the *wh*-phrase and triggering overt movement to satisfy [*u*Quant] and EPP features of the little v. In addition, the [Neg] feature inherited by *mou* grants two crucial interpretations: licensing the *wh*-quantifier as a negative indefinite as one constituent and the negative interpretation on its own. Overt and obligatory movement is driven by the uninterpretable [*u*Quant] and EPP features at v. By raising an object Neg-whQ (Neg-whQ$_{obj}$) to the [Spec, vp] position, [*u*Quant] and EPP features are checked and deleted. A Neg-whQ$_{obj}$ carrying a [Neg] feature, as a result of merge {mou {Ø, bingo}}, triggers the projection of NegP in the derivation and grants further raising to [Spec, NegP]. Two possible interpretations follow, negative and existential. The alternation between the two readings hinges on the interpretation of the negative morpheme *mou* interacting with the internal licensed *wh*-indefinite within the Neg-whQ after overtly raised to a preverbal position. The negative interpretation is triggered where the [Quant:_] is valued with the semantic

[Neg] feature under agreement with the negative operator OP¬, supposed [Quant: Neg] after valuation on the one hand. The split reading is made available due to the decomposition of Neg-whQs into negation and indefinites. The possible existential reading, on the other hand, is made available under double negation contexts. The double negation is caused by the *wh*-phrase appearing in a preverbal position that triggers it as Negative *Wh*-words (NWH) after split. NWH will be detailed in Chapter 2. In addition, the dual reading alternation is context dependent and there are contexts where either reading is forced and the other is oppressed. Different SPs appearing at [Spec, CP] force the two readings correspondingly. Suppose a [±p] feature on SP that is associated to the presupposition of whether or not there is implication in the background shared between the speaker and the addresser. The [±p] feature of SP at the [Spec, CP] values [Quant:_] into forcing either a negative or an existential reading. Neg-whQ constructions with a lowering tone at the end of the sentence or with SP of [-p] feature (e.g. *laa*3) tend to have non-existential readings. However, rhetorical contexts and contexts with SPs of [+p] feature (e.g. *zaa*3), indicate presuppositions of existence and tend to force existential readings. The structure in (5) displays the cyclic movements necessary to account for the two possible readings of a construction with a Neg-whQ$_{obj}$ and an optional SP as discussed:

5.



In contrast to Neg-whQ_{obj} ambiguity, a subject Neg-whQ (Neg-whQ_{subj}) is unambiguous and has only a negative reading if it appears in a sentence-initial position. However, a Neg-whQ_{subj} is ambiguous in relation to scrambling the universally quantified object ($\forall_{obj}$) in a doubly quantified construction. The Neg-whQ_{subj} is ambiguous when the $\forall_{obj}$ is scrambled to the front and precedes the Neg-whQ. Doubly quantified constructions, which involve a universal quantifier in English, allow both collective and distributive readings due to covert quantifier raising of the quantifiers in LF. In contrast to their English counterparts, the scope taking of these constructions obeys surface structure and doubly quantified constructions are subject to scrambling in Cantonese. The subject takes wide scope where it appears in a preceding position of the object in a non-scrambled structure; and the object takes wide scope where it appears in a preceding position of the subject in a scrambled structure. Therefore, a non-scrambled doubly quantified construction in an SOV order (Neg-whQ_{subj} $\forall_{obj}$ V) only has a subject-wide scope but not an object-wide scope. Thus, a collective reading is made available as shown in (6).

6. *Mou-bingo* muigin saammanzi dou soeng sik. (Neg-whQ>$\forall$, *$\forall$>Neg-whQ)
   no-who every sandwich also want eat
   'Nobody wants to eat every sandwich.'
   (Lit. 'Nobody wants to eat all the sandwich.')

Whereas the distributive reading is made available where the $\forall_{obj}$ is scrambled to the front and precedes the Neg-whQ_{subj} in the surface structure as in (7). In addition, the additional existential reading of a Neg-whQ is also forced where the Neg-whQ_{subj} is preceded by the $\forall_{obj}$ in an OSV order after scrambling ($\forall_{obj}$ Neg-whQ_{subj} V).

7. Muigin saammanzi dou *mou-bingo* soeng sik. ($\forall$>Neg-whQ, *Neg-whQ>$\forall$)
   every sandwich also no-who want eat
   a. 'For each sandwich x, nobody wants to eat x'
      (Lit. 'Nobody wants to eat any sandwich at all.')
   b. 'For each sandwich x, there is only a few people who want to eat x.'

In the second part of this thesis, an investigation of L2 acquisition of Neg-whQs by adult English speaking learners of Cantonese is conducted. Given that there is little evidence of empirical L2 studies of colloquial terms like Neg-whQs, this study presents an investigation of the L2 acquisition of Cantonese Neg-whQs. Three research questions guided the L2 study:

8. Can English-speaking learners of Cantonese acquire the syntax and semantics of a Neg-whQ$_{obj}$ construction?

9. Does the absence of a [Quant:_] feature in the learners' L1 English play a role in their acquisition of the dual reading of Cantonese Neg-whQs?

10. Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?

The experimental study aims to test the claim Full Access (FA) of Schwartz and Sprouse's (1994, 1996) Full Transfer/Full Access model (FT/FA) and looks at whether or not adult learners in their late L2 acquisition could fully acquire Neg-whQs ultimately. This study looks at L2 acquisition of colloquial terms, in which the amount of L2 input is crucial. In addition, this study will argue for the complex morphology of Neg-whQs being a bottleneck following Slabakova's Bottleneck Hypothesis (2006, 2008, 2010, 2013).

The following table summarises the similarities and differences of Neg-whQs and ordinary negative quantifiers (NegQs) between English and Cantonese:

Table 1: Comparison of Cantonese negative *wh*-quantifiers, Cantonese ordinary negative quantifiers and English negative quantifiers in an object position

	Neg-whQ		NegQ	
Language	Cantonese	English	Cantonese	English
Examples	*mou-bingo* ('no-who'), *mou-matje* ('no-what'), *mou-bindou* ('no-where')	*nowhere*, **no-what*, **no-who*	*moujan* ('no-one'), *mouje* ('nothing'), *mou-deifong* ('nowhere')	*nobody*, *nothing*
Syntactic Features	[Neg] [Quant:_]	[Neg]	[Neg]	[Neg]
Word Order	SOV	SVO	SOV	SVO
Movement	Overt	Covert	Covert	Overt
Interpretation(s)	Sentential negation / existential presupposition 'only a few'	Sentential negation	Sentential negation	Sentential negation

Although there appears a Neg-whQ counterpart in English (e.g. *nowhere*), *nowhere* has a simpler morphological structure as a result of the merge {no, DP} and bears a [Neg] feature. In contrast, Cantonese Neg-whQs have a complex structure as a result of the merge {mou {Ø, bingo}} and bear both [Quant:_] and [Neg] features. NegQs in both languages have the simple morphological structure and bear a [Neg] feature. Therefore, the additional existential reading is unique to Neg-whQs in Cantonese. However, object NegQs and Neg-whQs in Cantonese are both subject to overt and obligatory movements resulting to an SOV word order while their English counterparts require no overt movement and remain in a canonical SVO word order.

Chapter 4 presents a review of the most relevant studies in L2 acquisition and predicts L2 learners will have difficulty by virtue of this *wh*-quantifiers having a more complex morphological structure that is almost entirely absent from their L1. Empirical studies argue for the L1 influence following the FT/FA hypothesis (Haznedar 1997; Yuan 1998, 2010; Slabakova 2000) and learning difficulty is assumed due to full transfer of learners L1 grammar in the interlanguage. It is argued that with no external evidence for the change of interpretation of a doubly quantified construction that is contingent upon scrambling will lead to a poverty-of-the-stimulus problem (POS) (Schwartz and Sprouse 2000). Because there is no scrambling and no existential reading of Neg-whQs in English, the respective knowledge is underdetermined in the learners' L1 English or L2 Cantonese. It is doubtful that L2 learners' would acquire the change of reading if they treat the scrambled structure as a free from of the non-scrambled one. Furthermore, this chapter hypothesizes that the [Quant:_] feature needs to be added to the L2 Neg-whQ feature set in the interlanguage by adult acquirers in order to achieve successful acquisition. The missing [Quant:_] feature represents a major learning difficulty to learners. After reviewing empirical literatures related to L2 acquisition of *wh*-elements and readings involved in doubly quantified constructions, plausible experimental designs are adopted for the experimental work of this study.

Throughout the thesis, we will assume that the learning difficulty involved with Neg-whQs predicted in English Cantonese interlanguage is based on the following:

11. Lack of respective linguistic knowledge of Neg-whQs in L1 English
    a. There is no one-to-one morphological mapping of Neg-whQs, in particular there is a lack of [Quant:_] feature in NegQ feature set.
    b. Movements of quantifiers take place in LF rather than PF while *wh*-movements take place in PF rather than LF; and SOV word order of a Neg-whQ_{obj} is not observed.
    c. In English, no negative quantifiers (even its closest counterpart *nowhere*) can be interpreted as existential '*only a few*'.
    d. In English, there is no SP.
    e. English is not subject to scrambling. A doubly quantified sentence, where a universal quantifier ($\forall$) precedes a NegQ as in *Everyone eats nothing*, is unambiguous and always interpreted as negative.

12. Rare evidence from L2 input
    a. Colloquial terms like Neg-whQs are never covered in classroom teaching.
    b. There is rare evidence in the input for learners to retrieve the existential reading; and Neg-whQs are very likely to be avoided by native speakers conversing with learners in daily interaction.
    c. The addition of the existential reading made available after scrambling in (7b) is unique to a doubly quantified construction with a Neg-whQ$_{subj}$; there is no negative evidence that a scrambled doubly quantified construction with a Neg-whQ$_{subj}$ is different from other scrambled constructions (without Neg-whQ).

Chapter 5 presents the method used for the investigation and includes as preliminary study of the L2 acquisition of Cantonese Neg-whQs as well as a discussion of these changes made to the materials used for the main study. The chapter concludes with a description of the main study's materials. In order to test syntax, semantics, and syntax-semantics interface, three tests were devised. A grammaticality judgement task (GJT), context-based judgement task (CJT) and picture judgement task (PJT), were conducted to investigate learners' competence at the three phrases respectively. Chapter 6 reports results of the main experiment and answers the two research questions. The following hypotheses according to the three phases are considered in the thesis.

13. Syntax of Neg-whQs:
    - HYPOTHESIS 1: Intermediate learners will correctly accept the SOV order of a Neg-whQ$_{obj}$ construction with nonfinite verbs and incorrectly reject those with finite verbs, whereas advanced learners will correctly accept the correct SOV order and reject the incorrect SVO order regardless of finiteness.

14. Semantics of Neg-whQs:

EITHER: Failure to add [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 2: L2 learners, regardless of their proficiency level, will fail to acquire the implied existential interpretation of Neg-whQ+$SP_{[+p]}$ constructions. They will reject these constructions in existential contexts and accept them only in negative contexts.

OR: Success in adding the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 3: Advanced learners, but not intermediate learners, will correctly accept the implied existential interpretation of Neg-whQ+$SP_{[+p]}$ constructions in existential contexts but not negative contexts.

15. Neg-whQs at the syntax-semantics interface:

EITHER: Failure to add the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 4: Both groups of learners, regardless of their proficiency level, will associate non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V sentences with both collective and distributive readings, but incorrectly reject the distributive and existential 'only a few' reading and accept the collective reading associated to scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences.

OR: Success in adding [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 5: Both intermediate and advanced learners will associate non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V sentences with both collective and distributive readings. However, in scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences, intermediate learners will incorrectly reject the distributive and existential 'only a few' reading and accept the collective reading, whereas advanced learners will do the opposite.

16. HYPOTHESIS 6: Neither the intermediate nor advanced learners will acquire the correct interpretation over scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences without acquiring the existential reading of Neg-whQs.

Data was collected from adult English speaking learners of Cantonese and Cantonese native controls who completed a Cantonese proficiency test. The L1 English learner group was divided into intermediate and advanced learner groups. In the final part of the chapter, results from all three tasks are discussed. Last, Chapter 7 closes the thesis with a summary of the findings and answers the two research questions. Results from this investigation suggest that deficit in fully acquiring the dual reading and achieving native-like competence in scrambled doubly quantified constructions of Neg-whQs in L2 Cantonese is due to failure in adding the [Quant:_] feature to the Cantonese Neg-whQ feature set. Hence, the complex morphology of Neg-whQs, in particular the invisible quantifier operator Ø that bears [Quant:_] feature, is a bottleneck following Slabakova (2006, 2008, 2010, 2013). However, individual results from the advanced learner group also suggests there is full acquisition of Neg-whQs with continued input and provides some evidence for Schwartz and Sprouse's (1994, 1996) FA of the FT/FA model.

CHAPTER 2

THE NEG-*WH* QUANTIFIER (NEG-WHQ)

2.1. INTRODUCTION

As discussed briefly earlier, Neg-whQs are a type of negative quantifier in Cantonese, which results from the combination of a negative morpheme and a *wh*-phrase. *Mou-bindou* ‘no + where’, *mou-bingo* ‘no + who’ and *mou-matje* ‘no + what’ appear no different from their English counterpart *nowhere* in morphological terms, except that *no-who* and *no-what* are not real words in English. To look in depth at the actual differences between Neg-whQs in Cantonese and English in syntactic or semantic terms, this chapter begins with a discussion of how each component differs between Cantonese and English. Next, the chapter looks at the internal structure of a Neg-whQ and compares it with ordinary negative quantifiers (NegQ) in Cantonese and its close counterpart *nowhere* in English in section 2.2. In addition, the position where Neg-whQs$_{obj}$ appear in surface syntax, and interpretations denoted from a Neg-whQ$_{obj}$ construction are discussed in this section. In section 2.3, the discussion proceeds to features related to *wh*-phrases and the necessary contrast with those of English. This is because understanding the nature of *wh*-phrase as a crucial component of Neg-whQs, has an impact on the relevant syntactic features. Therefore, we will study the distribution and properties of *wh*-expressions in both *wh*-in-situ and *wh*-movement languages from a broader linguistic perspective. Firstly, we will compare the types of wh-movements in Cantonese with those in English, and present supporting data of Mandarin Chinese (MC). Secondly, we will consider cases in which Cantonese (or MC equivalent) *wh*-words are used in non-interrogative contexts, the negative *wh*-construction (Cheung, 2009) in particular. Section 2.4 concludes the syntactic analysis in this chapter with a summary.

2.2. WHAT IS A NEG-WHQ?

A Neg-whQ is a colloquial term that is internally composed of a negative morpheme and a *wh*-phrase in Cantonese. It is a type of *wh*-quantifier that is internally complex than other ordinary quantifiers such as *moujan*. The Quant-phrase (QP) has been proposed to account for the internal structure of Cantonese ordinary quantifiers falling into the following categories, and it will be further extended to account for *wh*-quantifiers later on.

17. **Quant**-phrase:

    QP
    X Y

18. Cantonese quantifiers:

    Cantonese quantifiers are formed by combining X and Y as in (1), where X is determiner-like element that determines whether the quantifier is universal (e.g. *sojau* 'every-'), negative (e.g. *mou* 'no-'), or existential (e.g. *jau* 'some-'), and Y can be any DP modified by X or any *wh*-phrases.

Ordinary negative quantifiers (NegQ) such as *mouje,* for example, have internal structure as in (17), while, Neg-whQs appear to have a more complex internal structure as that in (19):

19. Neg-*wh*Q:

    *Wh*QP
    mou *wh*Q'
    Q *wh*P
    Ø *matje/bingo/bindou*

I will now turn to explain the structure in (19). In the above structure, the negator *mou* (as X) immediately precedes the *wh*-phrase (as Y, e.g. *bingo* 'who', *matje* 'what' and *bindou* 'where') as one constituent. The *wh*QP, as an extended version of (17), has a complex hierarchical structure and gives the structure for *wh*-quantifiers in Cantonese.

The negative morpheme *mou*, is inserted in spec position (X) or else it can be left empty; the unpronounced quantifier operator Ø remains as the head; and any DPs including the *wh*-phrases are inserted as the complement of QuantP. This structure can possibly explains both cases where *wh*-phrases raise or licensed as indefinites or interrogatives in-situ. *Wh*-phrases in Cantonese (as a *wh*-in-situ language) can well be explained in the structure in (19) as well. They are licensed as interrogatives in-situ where the specifier position is left empty and the invisible operator is raised further up to CP to check [*u*Q].

Turning now to the semantic aspects of Neg-whQs and NegQs, these are semantically equivalent when they appear in the subject position in the following.

20. *Mou*-bingo zungji ngo.
    No-who like me
    'Nobody likes me.'

21. *Moujan* zungji ngo.
    Nobody like me
    'Nobody likes me.'

The Neg-whQ *mou-bingo* in (20) and NegQ *moujan* in (21) when in the subject position have a negative interpretation, on a par with their MC counterparts in (22) and (23):

22. *Meiyou-she* xihuan wo.
    No-who like me
    'Nobody likes me.'

23. *Meiyouran* *xihuan wo*.
    Nobody like me
    'Nobody likes me.'

However, a Neg-whQ$_{obj}$ is semantically distinctive from a NegQ$_{obj}$, even they both appear in an SOV word order in Cantonese. While SVO is the canonical word order in

Cantonese, object quantifiers, which have either *mou* or *jau* 'some' (lit. 'have') in specifier position (later referred to as *mou*-quantifiers *and jau*-quantifiers), are observed in an SOV word order. Both object Neg-whQ and NegQ (*mou*-quantifier) are obliged to appear in a preverbal position in (24 – 27).

24. Ngo_{subj} *mou-matje*$_{\text{obj}}$ zungji wo3.[1]
    I no-what like SP
    a. 'I like nothing.'
    b. 'I only like a few things.'

25. *Ngo_{subj} zungji *mou-matje*$_{\text{obj}}$ wo3.
    a. * 'I like nothing.'
    b. * 'I only like a few things.'

26. Ngo_{subj} *mouje*$_{\text{obj}}$ zungji wo3.
    I nothing like SP
    'I like nothing.'

27. *Ngo_{subj} zungji *mouje*$_{\text{obj}}$ wo3.
    * 'I like nothing.'

As (24) illustrates, a $\text{Neg-whQ}_{\text{obj}}$ construction is ambiguous in denoting negative reading, 'nothing' in (24a), and existential reading, 'only a few things' in (24b), whereas a NegQ_{obj} construction in (26) is unambiguous. $\text{Neg-whQ}_{\text{obj}}$ and NegQ_{obj} in an SVO structure leads to ungrammaticality in (25) and (27) respectively. Unlike Neg-whQ in Cantonese, the object *nowhere* in English has a negative interpretation and does not obligatorily surface in preverbal position as in (28).

28. This road leads to *nowhere.*

[1] Cantonese is a tonal language. Six numbers are used to mark the tones on SPs: 1 – high level; 2 – high rising; 3 – mid level; 4 – low falling; 5 – low rising; 6 – low level. The tones used to pronounce in sentence particles shall be further discussed in Chapter 3.

The following table summarises the word order and semantic properties of Neg-whQ$_{obj}$ and NegQ$_{obj}$ in both Cantonese and English. It will serve as a basis for the proposal of a feature-based analysis of Neg-whQ in the next Chapter.

Table 2: Comparison of an object negative *wh*-quantifier and negative quantifier in Cantonese and English

	Neg-whQ		NegQ	
Language	Cantonese	English	Cantonese	English
Examples	*mou-bingo*	*nowhere*	*moujan*	*nobody*
	('no-who')	**no-what*	('no-one')	*nothing*
	mou-matje	**no-who*	*mouje*	
	('no-what')		('nothing')	
	mou-bindou			
	('no-where')			
Word Order	SOV	SVO	SOV	SVO
Ambiguity	✓	✗	✗	✗

2.3. ON *WH*-PHRASES

The *wh*-phrase is crucial to the *wh*-quantifier status of Neg-whQs. As discussed previously, it is believed movement of the Neg-whQ$_{obj}$ in a canonical base SVO structure results in an obligatory SOV structure. To account for the proposed a Neg-whQ$_{obj}$ movement, this section looks at possible movements related to *wh*-phrases. Chomsky (1981, 1995b) suggests that languages vary cross-linguistically in having either overt or covert *wh*-movement. According to Huang (1982), *wh*-words in Chinese questions undergo movement (referred as Move WH) at Logical Form (LF) that has no consequence for the syntactic derivation. While English *wh*-phrases move overtly to a sentential initial position and move covertly at LF in, Chinese *wh*-phrases show movement properties at the level of LF.

29. Who do you like? (English)

30. Ni xihuan shei (ne)? (MC)
you like who (Q)
'Who do you like?'

31. LF: [$shei_i$ [ni xihuan e_i]] (MC)

While English *who* in (29) undergoes movement to a sentence-initial position from a complement position in the derivation, Mandarin Chinese *shei* stays in-situ in (30). There is considerable evidence in the literature to support the idea that Chinese and English differ for *wh*-movement, insofar as it is covert in the former language in (31) but overt in the latter, despite the underlying word order being SVO in both languages. Chinese *wh*-in-situ can also be accounted for, by the MOVE of a phonetically null question operator (see Watanabe, 1992; Aoun & Li, 1993; Tsai, 1994a, 1994b). Cantonese *wh*-words are tantamount to MC *wh*-words, as in (32) below. Note that the question particles *ne* in Chinese (30) and *le1* in Cantonese (32) are optional.

32. Nei zungji bingo (le1)? (Cantonese)
you like who (Q)
'Who do you like?'

33. LF: [CP Qu_i [nei zungji $bingo_i$]] (Cantonese)

However Aoun and Li (1993) suggest that question particles in Chinese are overt Qu-markers that belong to a minimal category X^0, and there is no need for in-situ *wh*-words to raise to Spec of Comp at LF in the presence of a Qu-operator as shown in (33). When the question particle is overt, it surfaces in Spec of CP and licenses in-situ *wh*-word as interrogative. Whenever question particle is absent, raising the invisible question operator Qu licenses in-situ *wh*-word as interrogative in (33). It follows that the invisible quantifier operator Ø proposed in the *Wh*QP structure possibly undergoes covert (LF) movement when the question particle is absent.

The structure in (34), can be extended to all *wh*-quantifiers where the specifier position can be left blank or be occupied by *mou* in the structure representing Neg-whQ in (19). We will return to the quantifier operator Ø and Cantonese SPs in more details in Chapter 3.

34. *Wh*QP:

    *Wh*QP
    *wh*Q'
    Q *wh*P
    Ø *matje/bingo/bindou*

In contrast to covert movement of question (or quantifier) operators in Chinese interrogatives, overt movement of English *wh*-words is driven by uninterpretable features. Chomsky (2000) suggests that *wh*-phrases have an uninterpretable feature [*u*WH] and interpretable [Q] feature in English. *Wh*-movement is forced by raising the *wh*-phrase into [Spec, CP] to check a [+WH] feature in C.

35. *Take wh-movement. This would be point-by-point analogous to A movement if the wh-phrase has an uninterpretable feature [wh-] and an interpretable feature [Q], which matches the uninterpretable probe [Q] of a complementizer in the final stage.*

    (Chomsky, 2000, p.128)

To take scope in overt syntax and receive interpretation, English *wh*-words have to move overtly to [Spec, CP]. As Chomsky suggests (1973) any movements (Move WH and FOCUS) move only into an unfilled COMP and end up in a quantifier position c-commanding its domain.

36. a. *He wonders Mary bought what?
    b. He wonders what did Mary buy?

The ungrammaticality of (36a) is due to the absence of obligatory *wh*-movements in overt syntax, it is ruled out with the *wh*-phrase *what* moving to the Spec of CP in the subordinate clause in (36b). The following two examples demonstrate instead how interpretation is obtained having the *wh*-word remains in-situ and the proposed unpronounced operator undergo overt movement in Cantonese.

37. a. Keoi soeng-zidou Mary maai-zo matje?
he wonder Mary bought what
'He wonders what did Mary buy?'
b. [$_{CP}$ [$_{IP}$ Keoi soeng-zidou [$_{CP}$ Ø$_i$ [$_{IP}$ Mary maai-zo [e$_i$ matje]]]]]

38. a. Keoi jingwai Mary maai-zo matje?
he think Mary bought what
'What does he think Mary bought?'
b. LF: [$_{CP}$ Ø$_i$ [$_{IP}$ Keoi jingwai [$_{CP}$ [$_{IP}$ Mary maai-zo [e$_i$ matje]]]]]

The Cantonese counterparts in (37a) and (38a) retain their grammaticality despite there being no movement. These examples provide an account against the need for *wh*-movements at LF because selectional restrictions of the matrix verbs are satisfied in LF not in syntax (Lasnik and Saito, 1984; Aoun, 1986). By means of the proposed invisible operator under the *Wh*QP structure, the right interpretation is obtained in overt syntax.

2.3.1. *WH*-PHRASES AS INDEFINITES

English and Cantonese *wh*-phrases/words differ from each other not only for the type of movement involved (overt *wh*-movement or operator movement), but also because Cantonese *wh*-words can have indefinite meanings. It has been suggested that Chinese *wh*-words can be interpreted not only as interrogative, but also as non-interrogative indefinites, such as the existential 'some-', polarity 'any-' and universal 'every-'. The distribution of non-interrogative indefinite *wh*-words is more restricted, syntactically and semantically, than the distribution of interrogative non-indefinite *wh*-words. As Lewis (1975) and Heim (1982) suggest, indefinites have no inherent quantification force, rather, they need a trigger in order to be licensed. Chinese *wh*-words are triggered as indefinites under a licensing relationship with licensers (see Huang, 1982; Cheng, 1984; Progovac, 1988; Cheng, 1991, 1994; Li, 1992; Lin, 1998, 2004). In order to be licensed as polarity items, for example, *wh*-words need to occur in contexts such as negative polarity contexts, non-factive contexts, and contexts of tentativeness and inference (Cheng, 1994). In order to be licensed as universal quantifiers, instead, indefinite *wh*-words need to take part in a *dou*-quantification (Cheng, 1993) context. Cantonese *wh*-words in these contexts are also triggered as indefinites in most of the cases resembling MC *wh*-words. More examples in both MC and Cantonese will be given in details below.

When *wh*-words are used as negative polarity items (NPI), also known as Existential Polarity *WH* (EPWs) in Huang (1982), they must be c-commanded by its licensers such as negators, 'not' in between repeated verbs (A–not–A), yes-no particles, conditional words such as 'if', the sentence final particle *le*[2], uncertainty adverbs indicating inference, and non-factive verbs. I will be discussing the licensing relationship of *wh*-words and the 7 licensers below.

Firstly, the absence and presence of negators has an effect of licensing a *wh*-word as NPI in MC:

39. *Ta xihuan shenme.
 he like $\text{what}_{[wh]}$
 'He likes something/anything.'

40. Ta bu/meiyou/mei xihuan shenme.
 he $\text{not}_{[Neg]}$ like $\text{what}_{[wh]}$
 'He doesn't like anything.'

Negators *bu* and *mei(you)* license *wh*-words situated in an object position as a NPI in (40). If negators are absent, *wh*-words in a non-interrogative context lead to ungrammaticality (39).

[2] The sentence final particle *le* is a licenser to *wh*-words in Mandarin Chinese but not Cantonese.

However, their Cantonese counterparts to (41) and (42) are illustrated below:

41. *Keoi zungji matje.
he like $what_{[wh]}$
'He likes something/anything.'

42. Keoi mou/m zungji matje.
he not $_{[Neg]}$ like $what_{[wh]}$
'He doesn't like anything.'

The same licensing relationship in MC is retained in Cantonese by the *wh*-words and negation licensers *mou* and *m* 'not'. The *wh*-word occurring in object position is c-commanded by the negator and therefore it can be interpreted as NPI. However, this is clearly not the case where *wh*-words are the subject in examples (43 – 44). In (43), the subject *Shei* in MC is not c-commanded by the negator *bu,* and therefore can only be interpreted as interrogative.

43. Shei bu xihuan ta?/*.
$who_{[wh]}$ $not_{[Neg]}$ like him
a. 'Who doesn't like him?'
b. *'Someone/Anyone doesn't like him.'

Below is an example in Cantonese.

44. Bingo mou zungji keoi?/*.
$who_{[wh]}$ $not_{[Neg]}$ like him
a. 'Who doesn't like him?'
b. *'Someone/Anyone doesn't like him.'

Subject *wh*-words *shei* in MC and *bingo* in Cantonese is not c-commanded by negator, and therefore (43b) and (44b) result in ungrammaticality in a non-interrogative context. Only the interpretation of an interrogative with a sentential negation is allowed in (43a) and (44a).

Secondly, the negators *bu* in MC and *m* in Cantonese between repeated verbs, forming A-not-A questions, are appropriate licensers of EPWs. Only object *wh*-words within the c-commanding scope of these licensers but subject *wh*-words can be licensed. The subject *wh* and object *wh* asymmetry in MC is displayed in (45 – 46).

45. *Shei xi-bu-xihuan ta?
who$_{[wh]}$ like-not-like$_{[A\text{-}not\text{-}A]}$ him
'Does someone/anyone like him?'

46. Ta xi-bu-xihuan shenme?
he like-not-like$_{[A\text{-}not\text{-}A]}$ what$_{[wh]}$
'Does he like something/anything?'

The subject *wh* and object *wh* asymmetry in Cantonese is illustrated in (47 – 48).

47. *Bingo zung-m-zungji keoi?
who$_{[wh]}$ like-not-like$_{[A\text{-}not\text{-}A]}$ him
'Does someone/anyone like him?'

48. Keoi zung-m-zungji bingo?
he like-not-like$_{[A\text{-}not\text{-}A]}$ who$_{[wh]}$
'Does he like someone/anyone?'

Thirdly, *wh*-words are also licensed as EPWs by question particles. MC and Cantonese question particles in a sentence-final position are analyzed as C^0 in literature (see Cheng, 1991; Cheng *et al.,* 1996; Tang, 1998; Cheng and Rooryck, 2000). The presence of question particles *ma* in MC and *aa* in Cantonese license both subject and object *wh*-words as EPWs.

The subject and object asymmetry previously considered disappeared with the presence of question particle *ma* as follows, reflected by the grammaticality of (49 – 50):

49. Shei xihuan ta ma?
    who_{subj} like him Q
    'Does anyone like him?'

50. Ta xihuan shenme ma?
    he like $what_{obj}$ Q
    'Does he like something/anything?'

According to Li (1992), *shei* 'who' and *shenme* 'what' *wh*-words are licensed as indefinites in (49 – 50) occurring in a context where the truth-value is not fixed with the yes-no question particle *ma.* Rather than being interrogatives, subject and object *wh*-words are construed as an indefinite element within the c-commanding domain of *ma* in [Spec, CP]. The subject *wh*-word *bingo* 'who' and *matje* 'what' in Cantonese are licensed as non-interrogative indefinite elements also by the question particles *aa4* in (51 – 52).

51. Bingo zungji keoi aa4?
    who_{subj} like him Q
    'Does anyone like him?'

52. Keoi zungji $matje_{obj}$ aa4?
    he like what Q
    'Does he like something/anything?'

Next, conditional words are also eligible to license either subject or object *wh*-words as non-interrogative indefinites. Conditional words appearing in sentence-initial position c-command *wh*-words and give non-interrogative readings in (53 – 56). Conditional words like *yaoshi* and *ruguo* 'if' in MC (53 – 54) and *juguo* in Cantonese (55 – 56) in the matrix Comp license both subject and object *wh*-words.

53. Yaoshi/Ruguo shei xihuan ta…
if who like him
'If anyone likes him….'

54. Yaoshi/Ruguo ta xihuan shei…
if he like who
'If he likes anyone…'

55. Juguo bingo zungji keoi….
if who like him
'If anyone like him…'

56. Juguo keoi zungji bingo…
if he like who
'If he likes anyone…'

Another context in which the EPW licensing relationship is retained are cases where where the proposition containing the EPW is a non-fact or the truth-value of the proposition is not positively fixed in a definite manner. The non-factive verbs in (57 – 58) indicate an assumption of the truth-value of the proposition. Therefore, *shei* 'who' in MC in (57) and *bingo* 'who' in Cantonese in (58), both within the scope of non-factive verbs, are licensed as EPWs.

57. Wo yiwei/renwei/cai/huaiyi ni xihuan shei.
I think/think/guess/suspect you like who
'I think/guess/suspect that you like something.'

58. Ngo jiwaai/jingwaai/gu/waaiji nei zungji bingo.
I think/think/guess/suspect you like who
'I think/guess/suspect that you like something.'

The uncertainty adverbs in (59 – 60) denote uncertainty of tentativeness. *Wh*-words *shenme* 'what' in MC in (59) and *matje* 'what' in Cantonese in (60) are licensed as the existential polarity item *something.*

59. Ta dagai/keneng/hoaxing/sihu/yexu xihuan shenme.
he probably / seem /perhaps like $what_{[EPW]}$
'He probably/seems to/perhaps like something.'

60. Keoi holan/hoci/wakze zungji matje.
he probably/seem/perhaps like $what_{[EPW]}$
'He probably/seems to/perhaps like something.'

The inference *le* in MC, less definite than a firm claim, and is also an appropriate licenser. When in sentence-final position, both the subject *wh*-word *shei* in (61) and the object *wh*-word *shenme* in (62) are licensed as EPWs.

61. Shei mai che le.
$Who_{[EPW]}$ buy car SP
'Someone bought a car.'

62. Ta mai shenme le.
he buy $what_{[EPW]}$ SP
'He bought something.'

However, only object *wh*-words can be licensed when they function as aspectual markers of verbs. This subject-object asymmetry is shown in (63) and (64). This licensing role of inference *le* is absent in Cantonese.

63. *Shei mai-le che.
who buy-ASP car
'Someone bought a car.'

64. Ta mai-le shenme.
he buy-ASP $what_{[EPW]}$
'He bought something.'

Lastly, *wh*-words can be interpreted as universal quantifiers in *dou*-quantification (Lee, 1986; Cheng, 1993, 1994). *Wh*-words preceding *dou* can be licensed as universal quantifiers. Examples (65 – 66) in MC demonstrate subject and object *wh*-words being quantified as a universal quantifiers by *dou.*

65. Shei dou xihuan ta.
    Who$_{[every]}$ all like him
    'Everyone likes him.'

66. Ta shenme dou xihuan.
    he what$_{[every]}$ all like
    'He likes everything.'

Wh-words in Cantonese are also licensed as universal quantifiers by *dou*-quantification in (67 – 68). Note that object *wh*-words being quantified by *dou* appears in a preverbal position in (68) in the same way that Neg-whQs do.

67. Bingo dou zungji keoi.
    who$_{[every]}$ all like him
    'Everyone likes him.'

68. Keoi matje dou zungji.
    he what$_{[every]}$ all like
    'He likes everything.'

The distribution of *wh*-words being licensed as indefinites supports the analysis that *wh*-words have no inherent quantificational force and require triggers.

2.3.2. *WH*-PHRASES AS NEGATIVE PROPOSITION

Apart from being licensed as indefinites, Cheung's (2009) survey claimed that *wh*-expressions are interpreted as negative proposition cross-linguistically. Cheung (2009) reports a few languages (e.g. Cantonese, Spanish, Korean, English, German, Japanese, and Hebrew) in which *wh*-expressions have a negative interpretation rather than an interrogative one: *since when* in English, *eti/ettehkhey* 'where/how' in Korean, *de dónde* 'of where' in Spanish and *bindou* 'where' in Cantonese. Two examples in Cantonese and English where *wh*-expressions have a negative meaning are reported in (1a) and (1d) from Cheung (2009: 298), and they are presented in (69 – 70):

69. Koei bindou jau hai tousyugun sik je aa3?! (Cantonese)
He where have be.at library eat thing Q
'No way did he eat anything in the library.'

70. Since when is John watching TV now?! (English)

Constructions conveying negative interpretations in special context involving the use of *wh*-expression are referred as the Negative *WH* construction (NWHC) (Cheung, 2006, 2009). NWHCs are used to show disapproval and make correction to a salient discourse with an assumption that the speaker and the recipient did not come to a conclusion to what the speaker believes (Cheung, 2009). The *wh*-word *na(r)* in MC is also a NWH-word. The symmetry of the NWH-word and the ordinary negator *mei(you)* in conveying negative reading is shown in (71). The Chinese *na(r)* rhetorical question in (71a) is used to deny the proposition of 'He is free' in its former context. No follow up answer is expected from this question type. Its interpretation resembles to a negative proposition as in (71b).

71. a. Ta na(r) xian-zhe?! (Hsieh, 2001, p.191 (4))
he where free-ASP '
'How is it possible that he is free?!'
b. Ta mei(you) xian-zhe.
he not(have) free-ASP
'He is not free.'

According to Hsieh's (2001), *na(r)* 'where' in preverbal position has an obligatory interpretation: a negative proposition as defined in (72). Moreover, it is stated that *na(r)* os typically base-generated in [Spec, QP], located in positions compatible with *zenme* ‘how’ but not negative markers because it represents an overt realization of an operator encoding the [+NEG] feature (cf. Progovac, 1988).

72. a. *Unlike a wh-question, a na(r)-rhetorical question has to be rhetorical obligatorily and it always implies a negative proposition.*
    b. *A na(r)-rhetorical question cannot occur with daodi 'indeed.'*
    c. *A na(r)-rhetorical question cannot serve as the complement of a verb that requires the complement to be interrogative.*

(Hsieh, 2001, p.195 (15))

The *wh*-word *shenme* ‘what’, when placed after auxiliaries *you* ‘have’ (73) and in between a repeated verb in rhetorical questions (74), is used as a strong negative implication in MC.

73. Zhe you shenme hao? (Hsieh, 2001, p.193 (8))
    this have what good
    ‘What good is this?’

74. Ni kan shenme kan? (Hsieh, 2001, p.193 (8))
    you look what look
    ‘What are you looking at?’

On a par with Chinese *na(r)*, Cheung (2006, 2009) suggests that NWHs in Cantonese also have a negative reading and can be translated closely as ‘no way…’ Furthermore, NWHs are mainly restricted to the short forms of Cantonese *wh*-words such as *bin(dou)* ‘where’, *dim* ‘how’ and *me* ‘what’, but not the long form of *dimjoeng* ‘how’ and *matje* ‘what’.

As for the distribution of NWHs, the negative interpretation of these NWHs can only be maintained in pre-modal position and usually the presence of a sentence final particle as illustrated in (75 – 77) (Cheung, 2006):

75.	Keoi	*bin*	jau	luksap	seoi	aa3?!
	he	where$_{[NWH]}$	have$_{[AUX]}$	sixty	year-old	SP

‘No way is he 60 years old.’

*‘Where will he be 60 years old?’

76.	Keoi	*dim*	wui	maai	go	bun	syu	aa3?!
	he	how$_{[NWH]}$	will$_{[AUX]}$	buy	the	CL	book	SP

‘No way will he buy the book.’

*‘How will he buy the book?’

77.	Keoi	*me*	wui	maai	go	bun	syu	aa3?!
	he	what$_{[NWH]}$	will$_{[AUX]}$	buy	the	CL	book	SP

‘No way will he buy the book.’

The negative meanings but not the interrogatives are allowed for NWHs occurring in pre- auxiliary positions. They can co-occur with negation in (78) and their pre-modal position in (79a) is also compatible with that of adverbs such as *mou-holan* ‘not possibly’ in (79b).

78.	Keoi	*bin*	jau	m	fanhok	zek1!
	he	where$_{[NWH]}$	have$_{[AUX]}$	not$_{[Neg]}$	go to school	SP

‘No way he is not going to school.’

79. a.	Keoi	*bin/dim*	wui	zungji	ngo	aa1?!
	he	where/how$_{[NWH]}$	will $_{[AUX]}$	like	me	SP

‘No way he will like me.’

b.	Keoi	mou-holan	wui	zungji	ngo.
	he	not-possibly$_{[ADV]}$	will$_{[AUX]}$	like	me

‘He won’t possibly like me.’

A negated interpretation is also available in (80) in contexts where the *wh*-word *bingo* 'who' in the long form appears in the subject position and before a modal verb.

80. *Bingo* wui zoek ji gin saam gaa3, gam watdak.
who will wear this piece clothes SP so ugly
'Who will ever wear this top? This is so ugly.'
(Lit. 'No way somebody will wear this top, so ugly (it is).')

I further analyze Cheung's account of NWHs in Cantonese as a variation of other *wh*-words in terms of their inherent syntactic features. On the one hand, NWHs bear an internal [*u*Neg] and a [-Q] feature, which engenders a negative rather than an interrogative reading. In contrast, ordinary *wh*-words bear [+/-Q] feature. Note that a *wh*-word such as *matje* ('what'), *bingo* ('who') and *bindou* ('where') is also interpreted as either interrogative or indefinite depending on contexts in which they appear. The interpretation of *wh*-words is due to the effect of the invisible operator Ø within the *Wh*QP structure and its [*u*Quant] feature, which was mentioned above and will be detailed in the next chapter. The following table compares the embedded features of NWHs and *wh*-words in Cantonese:

Table 3: Comparison of negative *wh*-words and *wh*-words

	NWHs	WHs
Examples	e.g. *bin(dou), dim, me, mat*	e.g. *matje, bingo, bindou, dimgaai, dimjoeng*
Features	[-Q] [*u*NEG]	[+/-Q]

The data presented so far suggests a [*u*Neg] feature encoded by *wh*-words and a negative reading is triggered when *wh*-words are in pre-modal positions. The [*u*Neg] feature and presence of a SP trigger NWHs to be construed as a non-interrogative reading. This ties a licensing relationship of *wh*-elements and SPs to be better described in the next chapter. The discussion of NWHs gives evidence to the dual interpretation of a morphological complex Neg-whQ having a composition of a negative morpheme and a *wh*-word. The negative interpretation of the *wh*-word within a Neg-whQ is possibly triggered in pre-modal position, hence, triggers the existential reading of a Neg-whQ in double negations. Perhaps, a unified account of Cantonese *wh*-words will be required to benefit the investigation in the future.

2.4. SUMMARY

In this chapter, it has been shown that even *wh*-in-situ languages like Mandarin Chinese and Cantonese involve movements, where this study is more towards the *wh*-operator movement account in overt syntax. The variation with *wh*-expressions in *wh*-movement and *wh*-in-situ languages lies that in English movement is overt and obligatory while MC movement is potentially covert at LF or involves overt movement of the *wh*-operator. Overt movements of *wh*-elements lead to *wh*-raising in English and *wh*-in-situ with a raised operator in MC and Cantonese. In addition, a subset of *wh*-words in Chinese and Cantonese can be triggered to have indefinite or negative meanings. In the former language, *wh*-words are licensed to have indefinite and negative interpretations by negators, A-not-A questions, question particles, conditional word, inference *le,* non-factive verbs, and *dou*-quantification. In comparison, the latter language restricts NWHs in pre-modal positions. While NWHs tend to be short forms of *wh*-words in Cantonese, NWHs only participate in *na(r)* rhetorical questions in Mandarin Chinese. The analysis presented suggests a potential [*u*NEG] encoded by NWHs as variants of *wh*-words. The discussion about *wh*-words in this chapter is fundamental to the syntactic proposal of Neg-whQs made throughout the thesis and the discussion later on in Chapter 3.

CHAPTER 3

A PROPOSAL FOR NEG-WHQ$_{OBJ}$ IN AN SOV WORD ORDER IN CANTONESE

3.1. INTRODUCTION

This chapter begins with Yip and Matthews' Cantonese data (2000) discussing the linguistic phenomenon of Neg-whQ$_{obj}$ constructions. Next, Neg-whQ$_{obj}$ is proposed to be a type of *wh*-quantifier, followed by the discussion of the proposed internal complex morphology and obligatory movements as one constituent in syntax. Overt quantifier raising (QR), which is observed in several languages, is primarily concerned. By introducing a (Neg-)QP, we aim to provide a unified account for all movements related to NegQs in Cantonese, in particular the Neg-whQ which is morphologically more complex. Unlike Principles and Parameters theory according to which QR has been proposed parameterized between being covert (English) and overt (Hungarian, French, and Icelandic etc.), under current Minimalist syntactic approaches, QR is triggered by matching and deleting features in the syntactic derivation in order for the moved quantifiers to receive the correct interpretation. Adopting Chomsky's Minimalist Programme (MP) (1995b) and his theory of Agree and EPP features, Neg-whQs are surmised to move to the Spec position of higher phrase in the structure.

Neg-whQs are a type of *wh*-quantifier in Cantonese, morphologically composed of a negative morpheme *mou* and a *wh*-word. They behave like other NegQs in that they both have a negative interpretation when in the subject position.

A Neg-whQ$_{subj}$ and a NegQ$_{subj}$ are exemplified in (81) and (82):

81. *Mou-bingo*$_{subj}$ zungji ngo.
    no-who$_{[Neg\text{-}whQ]}$ like me
    'Nobody likes me.'

82. Moujan$_{subj}$ zungji ngo.
    nobody$_{[NegQ]}$ like me
    'Nobody likes me.'

However, constructions with Neg-whQs$_{obj}$ are exceptionally found in SOV structures, while SVO is the canonical word order. In fact, a Neg-whQ$_{obj}$ in canonical object position as in (83) is ungrammatical. Neg-whQs$_{obj}$ must be located in a preverbal position in order to be grammaticality in (84). In addition to differing from NegQs for word order, Neg-whQs$_{obj}$ are distinct in having dual interpretation. As (84) illustrates, Neg-whQ$_{obj}$ constructions have an extra existential reading ('only a few' reading) in addition to its standard negative reading.

83. *Ngo zungji *mou-matje.*
    I like no-what
    'I like nothing.'

84. Ngo *mou-matje* zungji.
    I no-what like
    a. 'I like nothing.'
    b. 'I like only a few things.'

In this chapter, we will be focusing on Neg-whQs$_{obj}$, arguing they undergo obligatory and overt raising. Neg-whQs$_{obj}$ move as one constituent from their base-generated object position to a preverbal position. A type of ambiguity concerning Neg-whQ$_{obj}$ will be explained by the previously proposed (Neg)*Wh*QP structure. The proposed [Neg] and [Quant:_] features inherited in (Neg)*Wh*QP structure account for the movement of Neg-whQs$_{obj}$. Later in this chapter, Cantonese SP-related data will be provided to support the claim that the interpretation ambiguity is context-dependent.

There are contexts where only the negative reading is available while the 'only a few' reading is possible only in a Neg-whQ$_{obj}$ construction. This will be followed by an explanation of how the existential reading interacts with other quantifiers in doubly quantified constructions. Last, we further explain how the proposal is applied with more supportive data.

3.2. DATA FROM YIP AND MATTHEWS (2000)

In this section, Yip and Matthews (2000) is considered for two reasons. First, I report data from Cantonese to show that *wh*-words have special existential interpretation in negative sentences. Moreover, I bring Yip and Matthew's book to bear on the syntactic proposal claimed in this dissertation.

85.	*Mou-bingo*	wui	gam	chun	ge.
	No-who	will$_{[AUX]}$	so	stupid	SP

'Hardly anyone would be so stupid.'

According to Yip and Matthews, the interaction of a negative word and a *wh*-word before the auxiliary gives the meaning 'hardly at all' rather than 'not at all'. The same 'hardly'-interpretation in (85) remains even if *mou-bingo* is replaced by the NegQ *moujan* 'nobody'. Therefore it is questionable whether the negative *mou* in pre-modal position and the SP *ge* are playing an effect in giving existential interpretations here. However, the interpretation changes from 'hardly at all' to negative when a Neg-whQ is replaced by a NegQ, in Neg-whQ$_{obj}$ constructions. In the following examples cited from Yip and Matthews' data, the so-called 'hardly at all' or 'any + much' interpretation is only available via the interaction of the *mou* and *wh*-words, similar to the Neg-whQs proposed in this thesis.

86. Nei gamjat *mou* *matje* zou.
You today no what do
'You don't have anything much to do today.'

87. Ngodei *mou* *bindou* heoi.
We no where go
'We don't have anywhere much to go.'

88. Ngo *mou* *dim(jeong)* lam-guo.
I no how think-ASP
'I hardly gave it any thought.'

89. Nei gamjat *mou matje* zou, zinghaai jiu daa fon sun zek1.
You today no what do just/only need type CL letter SP
'You don't have anything much to do today, just type up a letter.'

Examples (86 – 89) support the availability of the existential interpretation even when SPs are absent while example (89) shows the presence of SP *zek1*. The above data supports the claim in the chapter that the additional existential reading is available with Neg-whQ$_{obj}$ constructions. However, is Neg-whQs are replaced by NegQs, the 'hardly at all' interpretation is no longer available. The above facts corroborate the proposal in this thesis that Neg-whQ$_{obj}$ constructions allow dual interpretation.

3.3. NEGATIVE *WH*-QUANTIFIERS (NEG-WHQS) MOVE AS ONE CONSTITUENT

Neg-whQs are a type of *wh*-quantifier in Cantonese following the discussion in the previous chapter. In example (90), the negative morpheme *mou* modifies the *wh*-phrase to form a compound that behaves more like a quantifier than a *wh*-element raised to preverbal position. This is due to the fact that, *jingwaai* 'think' does not take interrogative complements. The movement of a Neg-whQ also passes constituency tests, such as the stand-alone test, movements, and coordination, which will be discussed later on.

90. Ngo jingwaai nei *mou-bingo* soeng gin.
I think you no-who want meet
'I think you want to meet nobody.'

A Neg-whQ does not belong to a strong n-word (Giannakidou, 2002, p.2) because it does not necessarily have a sentential negation according to the definition below:

91. *N-word*
An expression is an n-word iff:
a. α can be used in structures containing sentential negation or another α-expression yielding a reading equivalent to one logical negation; and
b. α can provide a negative fragment answer.
(Giannakidou, 2002, p.2, (1))

Although Neg-whQs, such as *mou-bingo* in (92) stands alone as a negative fragment answer to a question, it yields both negative reading in (92a) and existential reading in (92b).

92. Q: Nei maai-zo matje (aa3)?
You buy-ASP what (SP)
'Who do you like?'
ANS: *Mou-matje* (ze1).
No-what (SP)
a. 'Nothing.'
b. 'Only a few things.' OR 'Not much.'

Apart from obligatory movement to preverbal position as shown in (84), repeated here as (93), a Neg-whQ$_{obj}$ also undergoes optional fronting to a sentence-initial position along with the SP *ze1* in (94) and optional clefting in (95).

93. Ngo *mou-matje* zungji.
    I no-what$_{obj}$ like
    a. 'I like nothing.
    b. 'I like only a few things.'

94. *Mou-matje*$_i$ ze1, ngo t_i maai-zo t_i.
    No-what$_{obj}$ SP I buy-ASP
    a. 'I bought nothing.'
    b. 'I only bought a few things.'

95. *Mou-bindou*$_i$ haai ngo zungji heoi ge.
    No-where is I like go SP
    'It is nowhere that I like to go.'

Since negative heads, which are typically filled by negative morpheme, are base-generated in Neg-head, it is arguable that Neg-whQs$_{obj}$ in SOV orders are the outcome of the *wh*-word$_{obj}$ being moved to attach to the negative morpheme *mou.* However, the optional fronting in (94) indicates that the Neg-whQ is topicalised and example (95) represents a cleft constituent corresponding to the focus. Both constructions suggest successive movements of *mou* and the *wh*-word moving as one constituent.

In addition, a Neg-whQ$_{obj}$ can occur in coordination structures as in (96 − 97):

96. Keoi [*mou-bingo* tungmaai *mou-matje*]$_i$ zungji t_i.
He no-who and no-what like
a. 'He likes nobody and nothing.'
b. 'He likes only a few people and things.'

97. Keoi *mou-matje*$_i$ [$_{VP}$ fong t_i jap doi] jinhou [$_{VP}$ lingzou t_i]
He no-what put in bag and then take away
a. ?'He puts nothing in the bag and takes away.'
b. 'He puts only a few things in the bag and takes away.'

Mou-bingo 'no+who' and *mou-matje* 'no+what' are coordinated by *tungmaai* 'and' as in (96). Example (96a) is subject to the Rule of Coordination of Likes, such that Neg-whQ can only coordinate with another negative quantifier with the same structure and the same non-existential nature. When the first Neg-whQ is interpreted as existential 'only a few', the second coordinated Neg-whQ has to be interpreted the same existential nature in the same way as in (96b). Such coordination is also subject to the Across-the-Board (ATB) Constraint, which is a single exception to Ross's (1967, p.89) Coordinate Structure Constraint, such that the Neg-whQ *mou-matje* can be extracted from the coordination of the two VPs as in (97).

Following Diesing's (1992) view, strong quantifiers must undergo obligatory QR mapping into the restrictive clause at LF, in which strong quantifiers involve a presuppositional reading and weak quantifiers involve a cardinal reading. The Neg-whQ in Cantonese is believed to be a kind of strong quantifier parallel to other strong quantifiers, which undergo obligatory raising in the syntax. The Neg-whQ$_{obj}$ as one constituent behaves like other strong quantifiers, negative quantifiers as exemplified in (98), and universal quantifiers as exemplified in (99), in observing overt QR and prompting a SOV structure in Cantonese.

98. Ngo *mou-je* sik-guo.
I no-thing eat-ASP
'I ate nothing.'

99. Mary *sojau-deifong* dou soeng heoi.
Mary every-place all want go
'Mary wants to go everywhere.'

In addition, Neg-whQs resembles Diesing's (1992) stage-level predicates in allowing stage-readings and are characterized in having proposition of something (temporally) of stages rather than an individual reading (permanent). Extraction of a Neg-whQ is allowed and survives in *there*-insertion sentences (Milsark, 1974) as in (100):

100. (Haait go beicoi), godou *mou-bingo* dui zigei mou seunsam.
(In the competition) there no-who to self no confidence
'There is nobody not having confidence of him/herself in the competition.'

Details of the presupposition reading will be discussed in the next section.

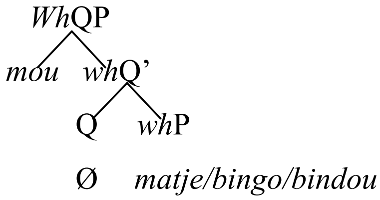
3.4. ACCOUNTING FOR THE OBLIGATORY MOVEMENT OF (OBJECT) NEG-WHQS

Given that Neg-whQ_{obj} constructions are ambiguous between the existential and non-existential reading as discussed, in this section I attempt to include a unified account of *wh*-phrases licensed as indefinites in Cantonese, and by extension to MC, by proposing a (Neg-wh)QP. I follow Cheng (1992) *wh*-phrases in Cantonese (like those in MC) are indefinites that can be licensed as interrogative words, polarity items, and universal quantifiers, as discussed in the previous chapter. However, *wh*-phrases do not have internal quantificational force on their own and need triggers. According to Huang (1982), Cheng (1991), Tsai (1994), Lin (1998), among many others, *wh*-phrases in modern Chinese exhibit the behavior of variables, not quantificational operators. I propose that *wh*-words (possibly in both MC and Cantonese) are triggered by an invisible operator Ø that gives quantificational force to the *wh*-phrases. The operator Ø grants *wh*-phrases an existential interpretation as polarity item and possibly triggers movements to satisfy an EPP feature. It is the preceding negative morpheme *mou* 'not' in Cantonese Neg-whQs, which bears a [Neg] feature that gives rise to the non-existential interpretation and possibly allows kinds of movement (e.g. Neg-raising) in order to receive a definite negative interpretation under feature checking. This analysis is based on a Norwegian Neg phrase in which 'ingen is in effect the Spell-Out of ikke+noen ('not+any/some')' (Kayne, 1998, p.130). The following sections will discuss in detail the proposed (Neg-wh)QP structure from a feature-based approach.

3.4.1. A PROPOSAL FOR A NEG-*WH*QP STRUCTURE

Following Chomsky's (2000) process for generating linguistic expressions, the general procedure is to minimize complexity during the process, so an Expression (EXP) is generated as derivation proceeds with no recourse to [F]. Elements of [F] are assembled as a one-time operation into The Lexicon (LEX) and Lexical Array (LA) is formed again by one-time selection from LEX. Then any syntactic operations may apply while mapping LA to EXP. Thus to look at Neg-whQs ('no' + '*wh*'), we assume that *wh*-words in Cantonese have unspecified features as quantifiers, which require triggers, and negative propositions, as discussed in the previous chapter. The MP was aimed at economy of representation, that is, selecting the most economical derivation of syntactic structures by limiting the number of syntactic operations in this theory. The operation *Merge* is motivated by feature checking, the operation of taking a pair of syntactic objects and matching all uninterpretable features with interpretable ones, replacing initial pair of objects with a new individual combined syntactic object. On the other hand, the operator *Move* involves raising syntactic objects by matching probes and goals under Agree (Chomsky, 2000). *Merge* and *Move* are governed by Last Report (LR) and Full Interpretation (FI). While LR requires that the computational system does not do "too much" by constraining what moves, FI prevents it from doing "too little" ensuring that movements should apply to the elimination of all uninterpretable features at the interface and guaranteeing that Phonetic Forms (PF) or Logical Form (LF)-laden element receives an appropriate interpretation. The unspecified features of *wh*-words therefore trigger Agree. Suppose that *wh*-words have an uninterpretable [*u*Quant] feature that needs to be checked and deleted by a quantifier operator.[3] The structure of a Neg-whQ as a type of *wh*-quantifier is represented in (19), repeated as (101):

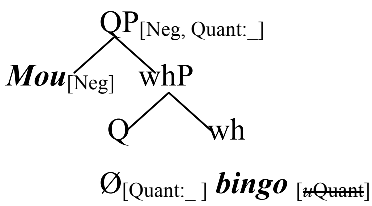
101. Neg-*wh*Q:



Suppose that a *wh*-quantifier has an unpronounced quantifier operator Ø in the *Wh*QP structure, and it licenses *wh*-words bearing an uninterpretable [*u*Quant] feature as quantifiers. In addition, this quantifier operator Ø bears a [Quant:_] feature and that needs to be valued by other elements (e.g. SP or sentence-final tones) in CP.

By proposing such a *wh*-quantifier, here I refine the structure in (101) as in (102):

102. (Neg-*wh*)QP:



Neg-whQs as negative indefinites bear an [Neg] and an unvalued [Quant:_] feature. The above structure represents the internal structure of complex quantifiers in Cantonese, which contrasts with NegQs with only one level of combining a negator and a DP e.g. *moujan* ‘no’ + ‘person’). Here, we focus on the structure in (101) as representing only Neg-whQs and will continue to refer to the structure as QP. The specifier position of the QP structure is filled by the negator *mou* also associated with a [Neg] feature, while, the head position is filled by an unpronounced quantifier operator Ø bearing [Quant:_] feature. The QP takes any *wh*-phrases (e.g. *matje* ‘what’,

[3] In Gil and Marsden (2013), an uninterpretable nonveridical feature [*u*NV] was introduced to *wh*-existential, where they suggest that there are two phonologically identical lexical entries for each *wh*-words in Chinese with one being *wh*-existential and the other being *wh*-interrogative.

bingo 'who' or *bindou* 'where'), which bears [*u*Quant], as complement. The negative morpheme *mou,* functions as a modifier to QP and helps to form a negative quantifier when the complement is a *wh*-word. The above QP with a *mou* classifier, following the merge ({mou {Ø, bingo}}), accounts for the structure of Neg-whQs as one constituent. I propose that Neg-whQ as a *wh*-quantifier in Cantonese bears a [Neg] and an unvalued [Quant:_] feature. It inherits both quantifying features [Neg] from the negative morpheme *mou* in the specifier position and [Quant:_] from the invisible quantifier operator Ø in the head position. The invisible operator Ø gives quantificational force to the *wh*-words, grants existential interpretation (as polarity item) and possibly triggers movements that satisfy the EPP feature. In addition, (Neg-*wh*)QP has a [Neg] feature and grants Neg-whQs with a negative interpretation.

According to Diesing (1992), 'strong quantifiers' must undergo overt QR. His analysis supports the claim of overt movements involved with Neg-whQs occurring in a preverbal position and accounts for the SOV structure in Cantonese. Overt movement and possibly QR, of Neg-whQs to a preverbal position is triggered by the uninterpretable and EPP features.

My proposal follows the account in Kratzer (1995), Potts (2000) and Penka and von Stechow (2001), whereby negative phrases can be decomposed into negation and an existential/indefinite element. Neg-whQs are structurally distinctive from ordinary NegQs in having an internally complex structure. While Neg-whQs are the result of the merge {mou {Ø, *wh*-word}} (e.g. {mou {Ø, *bingo* 'who'}}), NegQs have a simpler internal structure of the merge {mou, DP} (e.g. {mou, jan 'person'}). Based on the assumption that decomposition is required for a Neg-whQ, both existential and non-existential interpretations are made available by its internal complex structure in Neg-whQ$_{obj}$ constructions. The alternation of interpretations between negative and existential is context-dependent. We turn to discuss how negative and existential readings are determined in section 3.4.2.

Table 4 is a revised version of Table 2 which summarises the proposed feature based account of a Neg-whQ, its properties at the syntactic and semantic level, and compares Neg-whQs to its English near-equivalent, as well as NegQs in Cantonese and English.

Table 4: Comparison of Cantonese negative *wh*-quantifiers, Cantonese ordinary negative quantifiers and English negative quantifiers in an object position

	Neg-whQ		NegQ	
Language	Cantonese	English	Cantonese	English
Examples	*mou-bingo* ('no-who'), *mou-matje* ('no-what'), *mou-bindou* ('no-where')	*nowhere,* **no-what,* **no-who*	*Moujan* ('no-one'), *mouje* ('nothing'), *mou-deifong* ('nowhere')	*nobody,* *nothing*
Syntactic Features	[Neg] [Quant:_]	[Neg]	[Neg]	[Neg]
Word Order	SOV	SVO	SOV	SVO
Movement	Overt	Covert	Covert	Overt
Interpretation(s)	Sentential negation / existential presupposition 'only a few'	Sentential negation	Sentential negation	Sentential negation

103. Summary of the feature-based approach:

- [Neg][4] feature→ Agreement mechanism = checks the semantic [+Neg] at [Spec, NegP] and obtain sentential negation reading
- [Quant:_] feature → Syntactic overt raising mechanism = checks and deletes [*u*Quant], of *wh*-phrase internally and being attracted to [Spec, vP] (preverbal position) externally and be valued by operators at CP and license *wh*-words as indefinites (existential).

Like NegQs in Cantonese and English, Neg-whQs also bear a [Neg] feature which gives rise to the negative interpretation under the feature check and delete mechanism at [Spec, NegP]. However, Neg-whQs are distinct from NegQs and English Neg-whQ like *nowhere* in having a complex internal structure as a result of the merge {mou {Ø, *wh*-word}} and have an additional unvalued [Quant:_] feature. Neg-whQs are a type of *wh*-quantifier in Cantonese where a negator *mou* grants Neg-whQ the [Neg] feature and the unpronounced quantifier operator grants Neg-whQ the [Quant:_] feature, leading to the agreement and raising mechanisms in (103). In addition, a Neg-whQ$_{obj}$ as single constituent is attracted to check and delete [*u*Quant] at [Spec, vP] and appears in a pre-verbal position as a result of overt raising from its base-generated object position. Therefore, the SOV word order with a Neg-whQ$_{obj}$ is the result of the overt quantifier movement. Neg-whQ's dual interpretation is determined by the embedded [*u*Neg] property of the *wh*-word within a Neg-whQ, which is activated when it occurs in a pre-modal position and in the presence of SPs. In the case of *wh*-word in-situ, overt movement involves only the unpronounced operator Ø which carries the [Quant:_] feature which moves to a structurally higher position where the feature is valued. The raised operator Ø licenses *wh*-words as whatever indefinites depending on what is within the c-command domain (e.g. an NPI if there is a negator as the licensor). The alternative existential 'only a few' reading of Neg-whQs occurs in the double negation after decomposition. Particular SPs giving rise to the 'only a few' reading depending will be discussed in the next section.

[4] Zeijlstra (2004:245) proposes that negative expressions are associated with an [*u*Neg] feature. Although *mou* 'not-have' is semantically weaker than the negative operator *m* 'not' in Cantonese, I stick with [Neg] feature throughout the thesis.

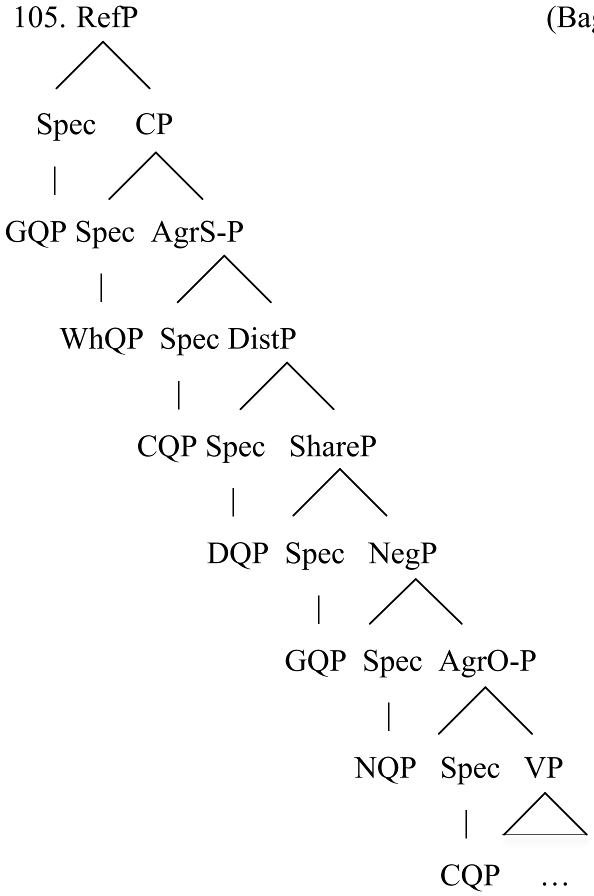
To summarise this section, Neg-whQs inherit both [Neg] and [Quant:_] features from the internal negative morpheme *mou* and unpronounced quantifier operator Ø. Having the quantificational force encoded in [Spec, vP], neg-whQs as *wh*-quantifiers are forced to undergo overt movement. In addition, the [Quant:_] feature which could valued by SPs or invisible elements (e.g. intonation) at CP give an alternation of negative and existential presuppositions to Neg-whQs. The next section actually details contexts where [Quant:_] is valued and the existential 'only a few' reading occurs.

3.4.2. ACCOUNTING FOR DUAL INTERPRETATION

This section looks at the possible movement involved in order to account for the dual interpretation of Neg-whQs$_{obj}$ under a feature-based account. By assuming that Neg-whQs are base-generated in the canonical object position, be proved in section 3.6, they undergoes successive movements triggered by uninterpretable and EPP features, resulting in SOV order.

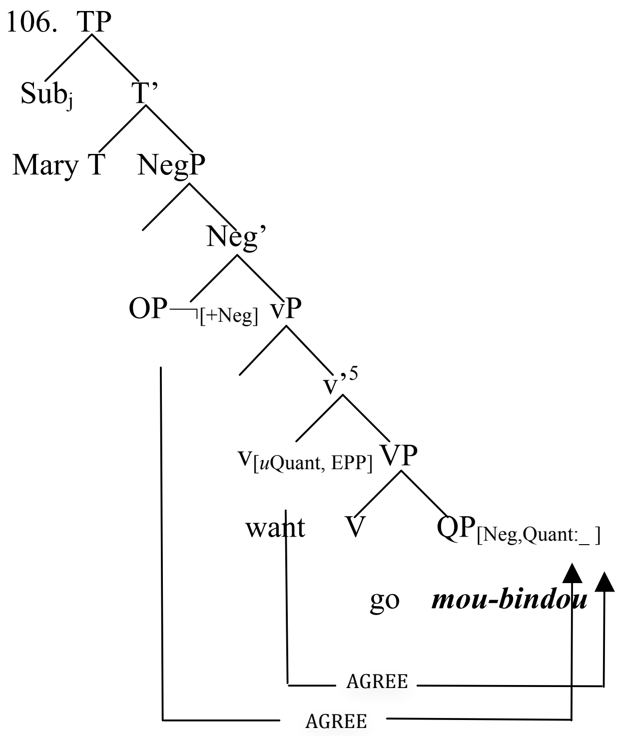
104. Mary *mou-bindou*$_i$ soeng heoi t_i.
     Mary no-where want go
     a. 'Mary wants to go to nowhere.'
        (Lit. 'Mary doesn't want to go to anywhere.')
     b. 'Mary only wants to go to a few places.'

105. (Bagehelli and Stowell, 1997, p.76, (2))



I assume Bagehelli and Stowell's (1997) account that the target landing site of negative quantifiers is [Spec, NegP] where it checks their respective logico-semantic features.

The syntactic derivation before any movement is as follows:



The Neg-whQ$_{obj}$ *mou-bingo* in (106) inherits both [Neg] and [Quant:_] features, matches the uninterpretable features [*u*Quant] and EPP of a probe v and checks the semantic [+Neg] feature of Neg^0, which undergoes successive obligatory overt movements. Features of the goal QP *mou-bindou* and those in the probes v and Neg-head match, and therefore prompt Agree as in (106) (right-angled arrows joining features or categories from left to right indicate probing throughout the chapters later on). I take into account Beghelli and Stowell's (1997, p.8) location of the five QP-types, whereby a Neg-whQ accords to NQP in (105) and "checks [+Neg] in Spec of NegP, under agreement with the Neg-operator in Neg^0".

The QP structure and the structure derivation could possibly account for two possible structures related to Neg-whQ$_{obj}$ constructions: SOV structure and Neg-raising structure (will be explained in section 3.4.3). The full interpretation of a Neg-whQ$_{obj}$ construction is accounted for based on the following assumptions for the two scenarios in (107).

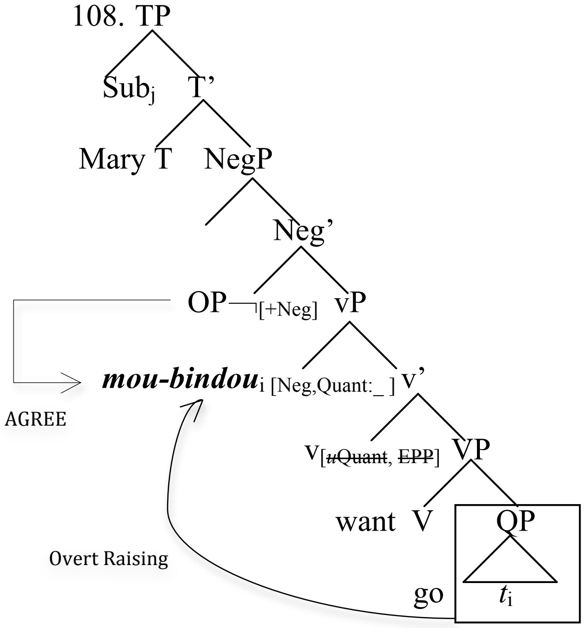
[5] Chomsky (1995) introduces the light verb v, which takes VP as its complement.

107. The two scenarios for pre-Spell-Out mechanisms of Neg-whQs$_{obj}$:

a. Obligatory movement takes place before Spell-Out and decomposition for QPs (which are internally complex) follows.

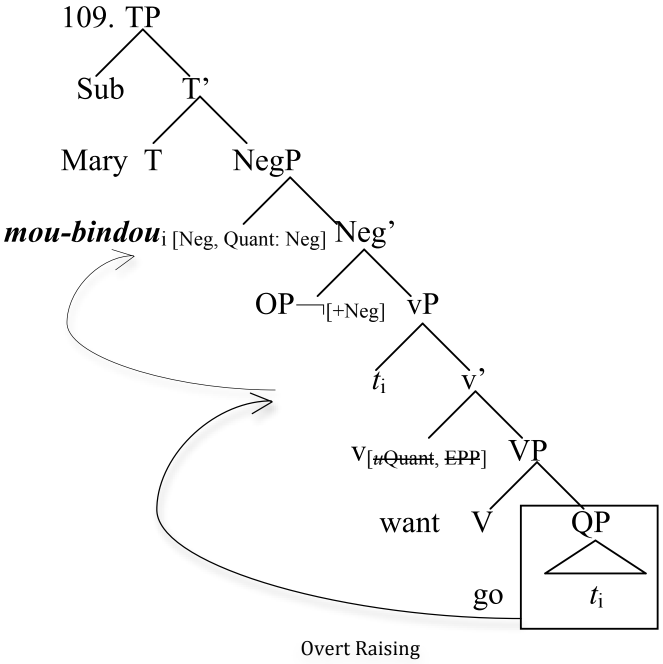
b. Decomposition for internally complex QPs takes place before Spell-Out and obligatory movements follow.

Based on the first scenario (107a), overt raising of a Neg-whQ$_{obj}$ is triggered by uninterpretable features as described below with the representation in (108).

108. 

The Neg-whQ$_{obj}$ *mou-bindou* undergoes overt raising to satisfy unvalued features (curved arrows joining categories from right to left indicate movement throughout the chapters later on). The EPP feature on v as Last Resort triggers movement of the Neg-whQ into [Spec, vP]. The probe v searches down its c-command domain and attracts *mou-bindou* for feature checking, valuing, and deletion. *Mou-bindou* first lands at [Spec, vP] where [uQuant] is valued and deleted. At this stage, the EPP feature is also checked and deleted. All features are checked by the probes, they became inactive, driving no further syntactic operations in overt syntax. Hence, Neg-whQs$_{obj}$ move to [Spec, vP] and nowhere else in overt syntax, resulting in the SOV word order. Such construction, with the Neg-whQ$_{obj}$ carrying an [Neg], triggers the projection of NegP in derivation and allows sentential negation.

109.

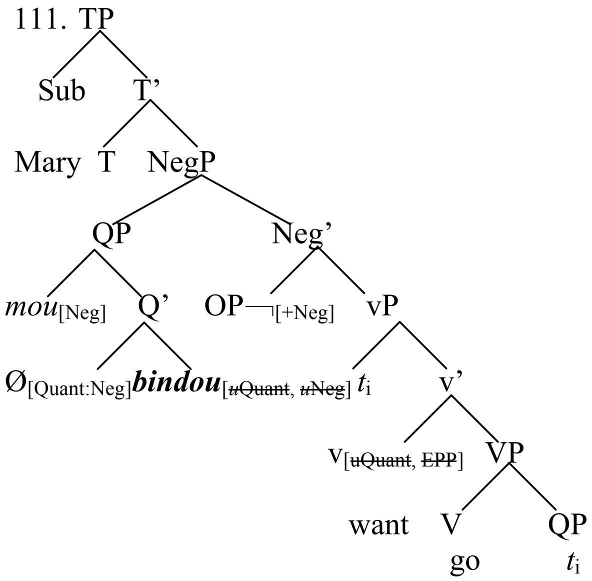


I follow Bagehelli and Stowell's (1997) account that negative quantifiers land at [Spec, NegP] so as to receive sentential negation interpretation. *Mou-bindou* undergoes further raising to [Spec, Neg] as a result. Regardless of the subsequent raising of *mou-bindou* to [Spec, NegP] being covert or overt movement, the syntactic structure of a Neg-whQ$_{obj}$ construction as an SOV order is preserved before Spell-Out. [Quant:_] is now valued with a semantic [Neg] feature, suppose [Quant: Neg] after valuation, and grants Neg-whQ negative interpretation, resulting in sentential negation interpretation. Under the assumption made in (107a) that the decomposition for *mou-bindou* follows after obligatory and overt movement, split reading is the outcome of the decomposition of Neg-whQ into negation and indefinites. In Chapter 2, data showed that *wh*-words can be used as NWHs with a negative reading when these elements are in pre-modal positions. In particular, NWH data in negated contexts brings forth the evidence for existential reading under double negation contexts. These *wh*-words are triggered as NWH when they located in a structurally higher position than a negative marker, where they inherit a [*u*Neg] feature. Example (80) is repeated here as (110):

110. Keoi *bin* jau m fanhok zek1!
he where have not go to school SP
'No way he is not going to school.'

Given the [*u*Neg] feature could be triggered when *wh*-words are in a pre-modal/negation position, the ambiguity of a Neg-whQ_{obj} could possibly be made available under the double negated context after decomposition. The following tree illustrates this idea:

111.



112. Semantic representation of the existential reading:

$\neg \ldots \neg \exists(x)$ [place (x) I want to go to x]

'It is not the case, such that there is not a place x that I want to go.'

(Lit. 'There is at least somewhere I want to go.')

However, the negative reading is dominant when there is no SP even though a Neg-whQ_{obj} construction is possibly ambiguous. Given that constructions with Neg-whQs_{obj} have a possible dual interpretation, each interpretation is always context dependent. Colloquial Cantonese, normally involves the use of tones and SPs at the end of each sentence. This not only conveys information about speakers' emotions, but also emphasis and possibly hint presuppositions of old information in a conversation. On the one hand, the existential 'only a few' reading is likely in the presence of an overt SP (e.g. *zimaa3* 'only' SP) or a rhetorical rising tone. On the other hand, the definite negative reading is likely in affirmed contexts, for example an overt SP (e.g. *ge3* 'assertion or emphasis') or a lowering tone.

113. Ngo *mou-bindou* soeng heoi zimaa3.
I no-where want go SP
'I want to go to only a few places.'
(Lit. 'There is not much where I want to go.')

The existential 'only a few' interpretation is forced in (113) when SP *zimaa3* is present. Other sentence final particles such as *zaa3* ('only'), *ze1/zek1* ('emphatic'), *zimaa3* ('only') or the rising tone of a rhetorical construction appear to bring an effect. The existential reading forced in the presence of SP is also supported by Tong and James' (1994, p.17) claim that some SPs "express moods and achieve certain rhetorical functions." The SP *zaa3* ('only') (Tang, 1998; Law, 2002) indicates a restrictive focus 'only', the existential interpretation of the Neg-whQ_{obj} *mou-matje* is pushed in (114) and the non-existential interpretation is no longer available. Examples (114 − 115) contrast the Neg-whQ_{obj} and the NegQ_{obj} in their interaction with SP *zaa3* ('only'):

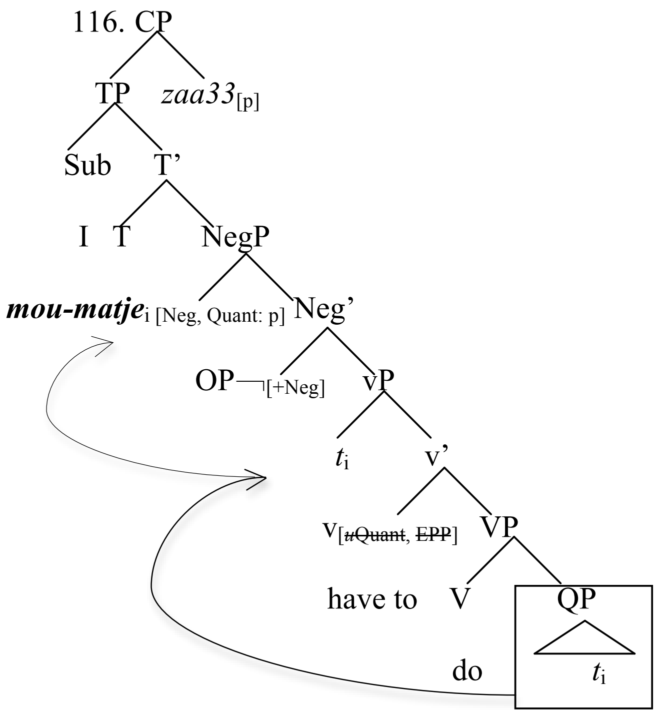
114. (Houcoi) ngo *mou-matje* jiu zou zaa3.
(Luckily) I no-what need do SP
a.*'(Luckily), I have to do nothing.'
b.'(Luckily), I have to do only a few things.'
(Lit. '(Luckily), there is not much that I have to do.')

115. *Ngo *mouje* jiu zou zaa33.
I nothing need do SP
'I have to do nothing.'

Following the proposal of Law (1990) and Law (2002), *zaa3* occurs in CP and is high enough to license the existential interpretation of *mou-matje* in (114). The co-occurrence of a NegQ *mouje* and the SP *zaa3* in (115) leads to ungrammaticality. Taken together these facts, this shows the complementary distribution of negative elements and the SP *zaa3*. Law (2002) argues that the SP *zaa3* has quantificational force and occupies an SFP_2 head that is higher than a Neg head in the clausal structure. SP *zaa3* behaves like focus operator *zinghai* ('only') that the focus associated can only be an element in its c-command domain (Cheung, 1997; Law

2003). It follows that SP *zaa3* blocks further (covert) movements of Neg-whQs from taking wider scope because it would violate Relativised Minimality (Rizzi, 1990). The structure of (114) is represented in (116):

116.



This representation can potentially explain why the negative interpretation as in (114a) is suppressed and the existential interpretation as in (114b) is allowed. Tentatively when *zaa3* is in a higher position than *mou-matje*, it quantifies it and gives rise to the existential interpretation. Suppose SP *zaa3* relates to a semantic [p] feature, presupposing information shared between the speaker and the addressee, which values [Quant:_] of the raised Neg-whQ$_{obj}$ with [p] resulting in [Quant:p] under its scope. This grants the Neg-whQ the 'something' interpretation and pushes the 'only a few' reading whereas the SP blocks further raising of the Neg-whQ and suppresses the negative reading in (114).

117.	Ngo	*mou-matje*	jiu	zou	ze1/zek1.
	I	no-what	have to	do	SP

a. ? 'I have to do nothing.'

b. 'I have to do only a few things.'

118. Ngo *mou-matje* jiu zou bo3.

I no-what have to do SP

a. ‘I have to do nothing.’

b. ? ‘I have to do only a few things.’

119. Keoi *mou-bingo* zungji ze/zek1.

he no-who like SP

a. ? ‘He likes nobody.’

b. ‘He likes only a few people.’

120. Keoi *mou-bingo* zungji bo3.

he no-who like SP

a. ‘He likes nobody.’

b. ? ‘He likes only a few people.’

The existential reading seems to oppress the negative one in Neg-whQ constructions (117) and (119) ending with the SPs *ze1/zek1,* and vice versa in (118) and (120) which end with the SP *bo3.* If we follow Law’s (2002) account, both *ze1/zek1* and *bo3* are at SFP_1 base-generated in the Force Head. However, SP *bo3* (‘reminder’) tends to have a lowering tone in contrast to SPs *ze1/zek1* (‘emphatic’) tend to have a rising tone. Therefore, we need to look at these SPs in relation to their use with related presuppositions. Law (2002) provides a more comprehensive syntactic analysis of SPs in Cantonese, grouping them into two types, which are those locate in [SFP_1] and [SFP_2] as illustrated in Table 4. According to Law, ‘[SFP_1] can be either [+Q] or [-Q] while [SFP_2] lacks the [Q] feature’ (2002, p.379). In general, only those with no [Q] feature or [-Q] feature may presuppose knowledge of something discussed or something taken place in the background shared between the speaker and addressee. We focus in those located in SFP_2 and only those located in SFP_1 with [-Q], and associate them with [$\pm$p] features accordingly later on.

Table 5 displays the semantic association of each SP in Cantonese:

Table 5: Cantonese sentence-final particles in CP[6]

SFP_2*	SFP_1 [±Q]	
zaa3 ('only')	*aa4*	
tim1 ('also/even')	*maa3*	[+Q]
laa3 ('inchoative')	*me1*	
	aa3 ('neutral softener')	
	bo3 ('reminder')	
	ge3 ('assertion')	
	gwaa3 ('probably')	
	laa1 ('lack of definiteness')	
	le1/ne1 ('tentative')	
	lo1 ('obviousness')	[-Q]
	lo3 ('irrevocability')	
	lok3 ('irrevocability')	
	wo3 ('reminder')	
	wo4 ('surprise')	
	wo5 ('hearsay')	
	ze1 ('downplay')	
	zek1 ('intimate')	

Law (2002) categorizes SPs mainly according to their scope taking in consideration either interrogative or non-interrogative contexts. Here I look at their co-occurrence with negative quantifiers and 'only a few' existential quantifiers in regard to the assumed [p] feature.

121.	Keoi	mouje	jiu	maai	SP_a.
	he	$nothing_{[NegQ]}$	have to	buy	$SP_{[-p]}$
	'He has to buy nothing!'				

[6] This table is reported as Table 7 in Law (2002, p.280).

122. Keoi zinghaai maai siusiu je SP_b.
he just/only buy a few thing $SP_{[+p]}$
'He has to buy a few things!'

Example (121) represents NegQ constructions while construction (122) involves the interaction of the focus operator *zinghaai* and existential quantified phrase 'only a few things' in existential contexts. These examples mimic the two possible interpretations embedded in Neg-whQ_{obj} construction because SPs are categorized as SP_a and SP_b. Sp_a occurs in negated contexts and bears a [-p] feature, whereas SP_b co-occurs with the focus operator *zinghaai* in existential contexts and bears a [+p] feature. Some SPs occur in both contexts and bear a [$\pm$p] feature. The following table shows the distribution of SPs in SFP_2 and those with [-Q] in SFP_1:

Table 6: Sentence-final particles in either negated or existential or both readings

SP_a in 'nothing' context [-p]	Both contexts [$\pm$p]	SP_b in 'only a few' context [+p]
laa3 ('inchoative')	aa3 ('neutral softener')	zaa3 ('only')
bo3 ('reminder')	bo3 ('reminder')	tim1 ('also/even')
ge3 ('assertion')	gwaa3 ('probably')	ze1 ('downplay')
laa1 ('lack of definiteness')	le1/ne1 ('tentative')	zek1 ('intimate')
lo3 ('irrevocability')	lo1 ('obviousness')	
lok3 ('irrevocability')	wo3 ('reminder')	
	wo4 ('surprise')	
	wo5 ('hearsay')	

Table 5 explains the effect of SPs in pushing either negative or existential 'only a few' readings in a Neg-whQ_{obj} construction.

123. Keoi *mou-matje* maai-zo zaa3(SP_b).
he no-what buy-ASP $SP_{[+p]}$
a. *'He bought nothing!' (Lit. 'There is nothing that he bought!')
b. 'He bought only a few things!'

The above (123) shows that *mou-matje* is only interpreted as existential in the presence of the perfective aspectual marker *–zo* and therefore the 'only a few' interpretation is pushed with SP *zaa3*. In this case the negative morpheme *mou* in Cantonese is lexically ambiguous. According to Cheng et al. (1996, p.68), *mou* as a negator is used with various aspects and accomplished verbs only, it cannot be used with the perfective aspectual marker *-zo* and can be interpreted as perfective on its own. Therefore, only the existential interpretation of *mou-matje* is kept in the presence of the perfective aspectual marker *–zo*. This analysis clearly suggests that the Neg-whQ$_{obj}$ *mou-matje* cannot be associated with negation in the above construction. Example (123) argues for the availability of existential reading of a Neg-whQ$_{obj}$ construction, as well as the claim that SPs bearing [+p] feature occurs only in existential contexts. The lexical ambiguity of *mou*, being a negator or interpreted as perfective on its own, explains the unambiguity of (124) even in the absence of a SP:

124. Keoi *mou-matje* maai-zo.
he no-what buy-ASP
a. *'He bought nothing.'
b. 'He bought only a few things.'

To summarise, this section explained the way, two features [Neg] and [Quant:_], account for the dual interpretation in Neg-whQ$_{obj}$ constructions and drive overt movement of a Neg-whQ$_{obj}$. In general, Neg-whQ constructions without SPs are ambiguous between a negative and existential reading, and the dual interpretation alternation is context-dependent. Rhetorical contexts and contexts with sentence final particles that bear a [+p] feature such as *zaa3* ('only'), *tim1* ('also/even'), and *ze1/zek1* ('emphatic') indicate presuppositions of existence and they privilege existential 'only a few' interpretations. In contrast, SPs with a [-p] feature like *laa3* tend to push negative readings. The dual interpretation alternation will depend very much on presuppositions created by discourse if the Neg-whQ$_{obj}$ construction ends with SPs bearing the [$\pm$p] feature. This section categorizes Cantonese SPs according to the construction mimicking the negative and 'only a few' readings embedded with Neg-whQs$_{obj}$.

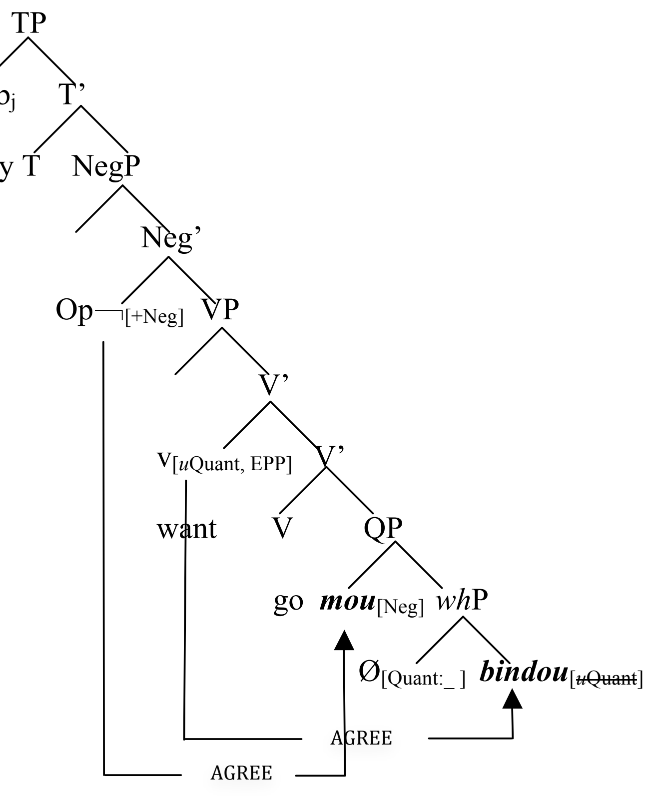
3.4.3. THE NEG-RAISING AS AN OPTION

Besides the SOV order of a Neg-whQ$_{obj}$ construction discussed, the assumptions above give the possibility of another movement referred to as 'Neg-raising' in this study. Such optional Neg-raising takes place when Neg-whQs are decomposed before any overt movements, and only the negative morpheme *mou* moves to a preverbal position giving the negative interpretation only as shown in example (125).

125. Mary *mou*$_i$ soeng heoi [$_{QP}$ t_i *bindou*].
Mary no want go where
'Mary doesn't want to go to anywhere.'

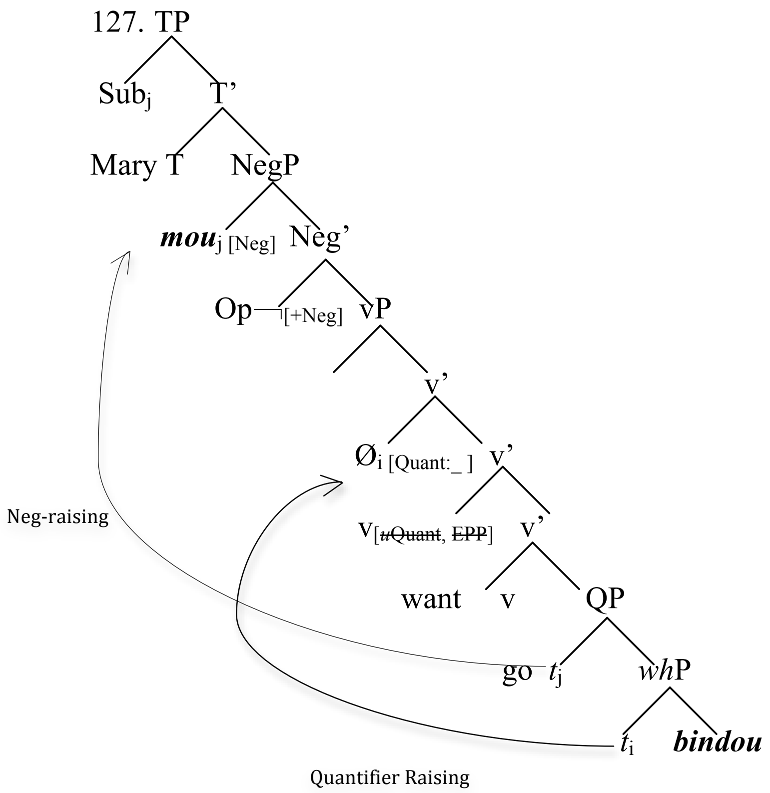
The syntactic derivation before any movement is explained in (126):

126.



Once the Neg-whQ is decomposed, the *wh*-word in QP is licensed as a negative polarity item (*wh*-words as indefinites to be licensed as NPI by negation in Cantonese were discussed in detail in Chapter 2). The probe v, carrying EPP and [*u*Quant] features searches down its c-command domain and attracts the closest feature

[Quant:_] after decomposition to *Move* to [Spec, vP] under Agree. The negative morpheme carrying [Neg] subsequently undergoes Neg-raising to obtain sentential negative interpretation in overt syntax.



The structure in (127) accounts for the Neg-raising structure, where the negative morpheme *mou* licenses the *wh*-word *bindou* in-situ as an NPI. The [*u*Quant] and EPP features are then both checked and deleted with the unpronounced operator Ø raising to [Spec, vP] which is invisible in overt syntax. Quantifier operator Ø raising and Neg-raising, which take place as a result of the Neg-whQ decomposition, obeys both Attract F and Minimal Link Condition constraints. Movements involved in (127) explain sentential negation only in constructions like (125) because the negative morpheme *mou* has a hierarchically higher position and c-commands Ø. The movements of the negative morpheme *mou* and Ø satisfy all feature checking while the *wh*-word remains in-situ. Since the negative morpheme moves out of QP leaving *wh*-word *bindou* within QP, it licenses the *wh*-in-situ as a NPI. A structure with *wh*-word in-situ is yielded, giving rise to the non-existential interpretation.

3.4.4. SUMMARY

To summarise, the proposed (Neg-*wh*)QP structure is composed of the specifier *mou* carrying an [Neg] feature, the head of an invisible quantifier operator Ø carrying the [Quant:_] feature, and any *wh*-word as complement. As one constituent, Neg-whQ inherits both [Neg] and [Quant:_] features. Neg-whQs can also be decomposed as negation and a polarity item. Following Chomsky's idea movements are triggered by EPP feature, a Neg-whQ$_{obj}$ being an internal complex *wh*-quantifier is attracted to move to [Spec, vP] in order to satisfy both EPP and [*u*Quant] features. Under the assumption of obligatory overt movement and the decomposition mechanism of Neg-whQs, (Neg-*wh*)QP is proposed to account for: i) the SOV structure with Neg-whQs$_{obj}$ which gives rise to dual interpretations; ii) optional Neg-raising (S–Neg–V–O) structure which gives rise to only a sentential negative interpretation. The SOV structure and the dual interpretation is a result of Neg-whQs undergoing raising to satisfy feature checking and landing in a preverbal position before decomposition. The Neg-whQ$_{obj}$ first moves to [Spec, vP], there it checks the EPP feature, then values and deletes the uninterpretable [*u*Quant] feature at v. The Neg-whQ carrying [Neg] undergoes further raising to [Spec, NegP] in order to receive full interpretation where the negative reading takes a wide scope. Decomposition takes place following overt movements, and the existential interpretation is made available in double negation contexts given *wh*-words in a preverbal position are NWHs and are related to negative readings. Later on, it is suggested that, SPs in CP give quantificational force to a Neg-whQ$_{obj}$ since SPs have the power to presuppose implications of the background shared between the speaker and the addressee. SPs with a [+p] feature in particular push the existential 'only a few' reading of a Neg-whQ$_{obj}$ construction whereas those with a [-p] feature push a negative reading over the existential one. Where there is the neutral SP with a [$\pm$p] feature, dual interpretation depends on other means of presupposition (e.g. old information or tones) in discourse. With the optional Neg-raising alternatives, only the sentential negation interpretation is preserved when decomposition takes place before overt movements in syntax. The negator *mou* moves to [Spec, NegP] and licenses the *wh*-phrase in-situ as an NPI.

3.5. BASE-GENERATION VERSUS MOVEMENT

In this section, I provide data to argue for the proposed overt movement account for the SOV order of a Neg-whQ_{obj} construction as shown in (128). Rather than the Neg-whQ_{obj} being base-generated in the preverbal position, I will argue that an object Neg-whQ undergoes overt movement to a preverbal position.

128. Ngo *mou-matje* zungji.
     I no-what like
     a. 'I like nothing.'
     b. 'I like only a few things.'

3.5.1. RELATING TO A GAP UNDER LONG-DISTANCE RAISING

According to Chomsky (1977) and Huang (1982), a syntactic movement takes place if there is a Subjacency effect in relating an element with a trace embedded in an island. I illustrate this by discussing data on Neg-whQ_{obj} constructions involving long-distance movements from subordinate clauses. Relevant data regarding a gap embedded in a subordinate clause is given below:

129. Keoi *mou-bingo*$_i$ wa [$_{CP}$ t_i [$_{IP}$ nei t_i soeng gin [$_{NP}$ t_i]]].
     he no-who say you want meet
     'Nobody$_i$, he says you want to meet t_i.'

130. *Subjacency Condition*[d]
     a. *In a structure α...[β ...[γ ...δ...]...]..., movement of δ to α cannot apply if β and γ*
     b. *are bounding nodes.*
     c. *DP and TP are bounding nodes.*

(Chomsky, 1977)

As shown in (129), the Neg-whQ *mou-matje* moves within a bi-clausal sentence where it passes only one bounding IP node. Successive-cyclic movement takes place, which leaves an intermediate trace at spec of CP, forms an escape hatch and therefore

(129) is unproblematic. Movements that are abided by Subjacency condition are illustrated in examples (131 – 132):

131. Ngo	zungji [$_{IP}$	nei	*mou-matje*$_i$	m	sik [$_{NP}$ t_i]].
I	like	you	no-what	not	eat

a. ‘I like that there is nothing that you don’t eat.’

b. ‘I like that there is only a few things that you don’t eat.’

132. *Ngo	zungji	*mou-matje$_i$* [$_{IP}$ nei	t_i	m	sik [$_{NP}$ t_i]].
I	like	no-what	you		not	eat

Example (131) is unproblematic because the Neg-whQ stays in the subordinate clause. However, *mou-matje* is not allowed to move outside the subordinate clause in constructions where the subordinate clause is dependent to the matrix verb in (132). Assuming Chomsky’s (1973) successive cyclicity, such movement leaves intermediate traces for checking EPP features violating Subjacency Condition (details in (130) (Chomsky, 1977)) because the raised object NP has to cross two bounding nodes (NP and IP). By contrast, if Neg-whQ is base-generated in preverbal position, its fronting needs to cross only one bounding node. As a result, the ungrammaticality of (132) is not accounted for since there is no Subjacency violation when crossing only one bounding node.

133. I know someone who met every girl. ($\exists > \forall$, $*\forall > \exists$)

134. *Ngo	*mou-bingo*$_i$	gotdak [$_{IP}$ t_i	nei t_i	gin-guo t_i].
I	no-who	think	you	meet-ASP

135. Ngo	*mou-bingo*$_i$	gotdak [$_{IP}$ t_i	nei t_i	gin-guo	keoi$_i$].
I	no-who	think	you	meet-ASP	him

‘Nobody$_i$, I think you met him$_i$.’

A strong islandhood (Chomsky, 1986; Ross, 1967) is also observed when the embedded clause is overtly marked as finite with the past tense marker –*guo* in (134). According to May (1985), QR is always assumed to be clause bound, therefore *every* *girl* in (133) does not take wide scope. Moving a Neg-whQ from the embedded clause is forbidden and leads to ungrammaticality in (134). Such movement is on a par with *wh*-movement according to Chomsky (1986) and Manzini (1992) who maintain that optional movement is blocked from a tensed embedded clause. However, the ungrammaticality is loosened when the gap is replaced by a resumptive pronoun in (135) (Aoun, Choueiri, and Hornstein, 2001).

136. *Ngo	***mou-bingo***$_i$	gotdak [$_{IP}$ t_i	nei	keoi$_i$	gin-guo].
I	no-who	think	you	him	meet-ASP

According to Chomsky (1977) and Cheng (1991), it can be argued that Left Dislocation involves movements of an NP to a higher position followed by the subsequent deletion of the overt resumptive pronoun in the position of the gap in PF. If Neg-whQ is base-generated in preverbal position in an SOV structure, then we do not expect the resumptive pronoun *keoi* occurring in the base-generated object position within a SVO structure. In addition, if *mou-bingo* is base-generated in preverbal position, replacing its trace by the use of resumptive pronouns as in (136) should result in grammaticality. However, this is not the case.

Relevant data regarding a gap embedded in a relative clause (complex NP) is given in (137 – 138):

137. *Ngo	*mou-bingo*$_i$	teng-guo [$_{NP}$ (t_i)	[$_{IP}$ nei t_i	zungji-guo	[$_{NP}$ t_i]	ge gongfat]].
I	no-who	hear-ASP	you	like-ASP		GE saying

138. Ngo	*mou-bingo*$_i$	teng-guo [$_{NP}$ (t_i)	[$_{IP}$ nei t_i	zungji-guo	[$_{NP}$ keoi$_i$]	ge gongfat]].
I	no-who	hear-ASP	you	like-ASP	him	GE saying

‘Nobody$_i$, I heard the saying that you liked him$_i$.’

As a consequence of the Complex NP Constraint, moving *mou-bingo* from the complex NP in (137) leads to ungrammaticality and violates Subjacency. Complex NP violation, however, can be rescued by a resumptive pronoun as shown in (138).

3.5.2. THE INTERACTION OF NEG-WHQS WITH THE NEGATOR *M*

Neg-whQs can be used in a negated context such as in (139):

139. John *mou-bingo* m zungji.
John no-who not like
a. 'John doesn't like nobody.'
(Lit. 'There is nobody that John doesn't like.' Or 'John dislikes nobody.')
b. 'John doesn't like only a few people.'
(Lit. 'There are only a few people that John doesn't like.' Or 'John dislikes only a few people.')

140. *John m *mou-bingo* zungji.
John not no-who like

141. John *mou-bingo* wa Mary m zungji.
John no-who say Mary not like
'Nobody$_i$, John says Mary doesn't like t_i.'

The raised Neg-whQ *mou-bingo* must precede the negator *m*[7] in all circumstances, or else ungrammaticality results, as in (140). Where NegP is projected in negated contexts, the negator *m* stays in the head of NegP and it is postulated that Neg-whQs raise to a higher position than *m* ([Spec, NegP]), to be discussed in detail later. This is simply because the NegP head cannot be filled twice when the Neg-whQs and the negator *m* co-occur. The Neg-whQ and the negator do not form a single constituent because the Neg-whQ can actually occur in constructions like (141) where it further moves optionally to a position preceding the matrix verb in a bi-clausal sentence.

[7] According to Cheng et al. (1996, p.68), the negator *m* is used with bare verbs and modals and cannot be used with any aspectual markers.

142. Ngo zyundan m gin nei.

I intentionally not meet you

'I don't meet you intentionally.'

143. Ngo *mou-matje* zyundan m sik.

I no-what intentionally not eat

a. 'I don't eat anything intentionally.'

(Lit. 'There is nothing that I don't intentionally eat.')

b. 'I don't intentionally eat only a few things.'

144. *Ngo m zyundan gin nei.

Adverbs like *zyundan* 'intentionally' can be inserted between the Neg-whQ and *m* and must always be presented before the negator *m* and the verb as in (142). The adverb can therefore appear between the raised Neg-whQ and the negator as in (143). Example (144), though is ungrammatical, when the adverb *zyundan* is between the negator and the verb. This suggests that Neg-whQs are not base-generated in the head of NegP like negator *m*.

To summarise this section, Neg-whQs are base-generated in the object position of a canonical SVO structure. This is supported by indexing a raised Neg-whQ$_{obj}$ to a gap in either a subordinate finite clause or in a complex NP where the Subjacency condition is met. In addition, the Neg-whQ seems to have a hierarchically higher position than *m*. This is supported by the fact that Neg-whQs must always precede *m*, and no adverb can intervene between them despite the fact that adverbs always precede negators in Cantonese. Therefore the Neg-whQ is proposed to be base-generated in a post-verbal position in canonical SVO sentences and moves to a preverbal position so as to maintain grammaticality.

3.6. OVERT QUANTIFIER MOVEMENT OF CANTONESE NEG-WHQS

The movement undergone by the Neg-whQ$_{obj}$ cannot simply be referred to as Chomsky's object shift (2001) since such raising is restricted to, and even obligatory for, object quantifiers in Cantonese, resulting SOV order. This section follows the current Minimalist syntactic approaches movements are driven by features in order to receive the correct interpretation. While QR is parameterized between being covert and overt, this study argues that the observed movement with Cantonese Neg-whQ is a kind of overt QR as suggested by Rögnvaldsson (1987), Haegeman (1995) and Rizzi (1990). Such overt QR is observed in languages such as French with its "strong" quantifiers and either optionally or obligatory depending on scope taking in Icelandic, and obligatory in Cantonese and MC.

3.6.1. EVIDENCE IN OTHER LANGUAGES

Many studies, which have looked at (obligatory or optional) overt QR in Hungarian (Kiss 1995), French (Confais, 1978; Haegeman, 1995; Nølke, 1997; Rizzi, 1990) and Scandinavian languages (Rögnvaldsson, 1987; Svenonius, 2000b; Christensen, 2003, 2004) have argued the landing site of these negative or quantified objects is a position that precedes the vP domain.

In Icelandic, overt QR is observed with quantifiers such as *ýmislegt* 'various' and *margar* 'many' and these quantifiers may move optionally across the verb. However, the indefinite negative quantifier in the following two examples has to move to a preverbal position in order to license a sentential negation interpretation. Christensen (2004) refers to such movement as a NEG-shift.

145. Hann mum ekkert hafa getadh geit. (Rögnvaldsson, 1987, p.44)
he will nothing have could done
'He won't have been able to do anything.'

146. Their hafa effert lofadh adh gera. (Jónsson, 1996, p.86)
they have nothing promised to do
'They haven't promised to do anything.'

147. a. Ég hef [$_{vP}$ fengiõ engine stig] (Christensen, 2004, p.6, (17))
I have received no points
i. Zero-quantification: 'I scored zero points.'
ii. *Sentential negation: 'I haven't got any point yet/I haven't been judged yet.'
b. Ég hef [$_{NegP}$ [engine stig]$_i$ [$_{vP}$ fengiõ t_i]]
i. Zero-quantification: 'I scored zero points.'
ii. Sentential negation: 'I haven't got any point yet/I haven't been judged yet.'

In Danish, the sentential negation interpretation is only available with a shifted *ignen* object, as in (148):

148. a. Jeg har [$_{vP}$ fået *ignen* point]. (Christensen, 2004, p.6, (19))
I have receive no points
i. Zero-quantification: 'I scored zero points.'
ii. *Sentential negation: 'I haven't got any points yet/I haven't been judged yet.'
b. Jeg har [$_{NegP}$ [ignen point]$_i$ [$_{vP}$ fået t_i]].
i. *Zero-quantification: 'I scored zero points.'
ii. Sentential negation: 'I haven't got any point yet/I haven't been judged yet.'

In addition, overt QR is observed with quantified NP in Hungarian as in (149), where *minden diákot* raises to a position preceding the matrix verb in a conditional clause.

149. János [minden diákot]$_i$ [$_{VP}$ szeretne [ha meghívná e_i]]. (Kiss, 1995, p.226)
John every student would:like if invited:we
'John would like if we invited every student.'

In French, *personne* 'nobody' cannot be raised to preverbal position as in (150b), but the "strong" quantifier *rien* 'nothing' must be raised to a topmost specifier position of vP as in (151b) to maintain grammaticality.

150. a. Je n'ai [$_{vP}$ vu personne] (cf. Confais, 1978, p.135)
b. *Je n'ai [personne$_i$ [$_{vP}$ vu t_i]]
I NEG-have nobody seen
'I haven't seen anybody.'

151. a. *Pierre n'a [$_{vP}$ mangé rien] (cf. Nølke, 1997, p.234)
b. Pierre n'a [rien$_i$ [$_{vP}$ mangé t_i]]
Pierre NEG-has nothing eaten
'Pierre didn't eat anything.'

Other quantifiers like *tout* 'all' and *beaucoup* 'many' are allowed to move to the specifier of vP optionally as in examples (152–153):

152. a. J'ai [$_{vP}$ vu tout] (Haegeman, 1995, p.231)
b. J'ai [tout$_i$ [$_{vP}$ vu t_i]]
I-have all seen
'I have seen everything.'

153. a. Il a [$_{vP}$ consulté beaucoup de livres] (Rizzi, 1990, p.12)
b. Il a [beaucoup$_i$ [$_{vP}$ consulté t_i de livres]]
he has many consulted of books
'He consulted many books.'

3.6.2. OVERT QUANTIFIER RAISING IN CANTONESE (VERSUS MANDARIN CHINESE)

In Archaic Chinese of the Warring State period (475 – 221 BC), object *wh*-phrases were required to occur in a position between subject and verb as in example (154):

154. Wu *shei* qi? Qi tian hu? (Aldridge, 2006, p.1)
I who deceive deceive heaven Q
'Who do I deceive? Do I deceive heaven?'

The *wh*-word *shei* 'who' refers to the object *tian* 'heaven' in postverbal position as a non-*wh* object in the second question. This suggests a long history of movements regarding object phrases which consist of *wh*-elements: such movement was actually hypothesized as "the result of a general prohibition on quantificational material in VP" (Aldridge, 2006, p.13).

In relation to modern Chinese, a *wh*-in-situ language, I propose that movements relating to a Neg-whQ$_{obj}$ and its composition as a negative morpheme *mou* and a *wh*-word are also due to the quantificational force and that strong quantified elements like Neg-whQ are not allowed to occur within VP. This seems to also be the case in MC regarding object NPs, as in (155), quantified by *dou* as discussed in Cheng's (1993) work; *dou* also gives quantificational force to the *wh*-phrase, as in (156) creating a structure where objects are in preverbal positions.

155. Lisi zhexie xuesheng *dou* xihuan (Cheng, 1993, p.224, (56))
Lisi these students all like
a. *'Lisi likes all these students.'
b. 'All these students like Lisi.'

156. Zhangsan *shenme dou* chi. (Cheng, 1993, p. 202, (15b))
Zhangsan what all eat
'Zhangsan eats everything.'

However, there seems not to be one constituent referring to negative quantification in MC. Regardless of a number of syntactic properties, such as the canonical SVO order, lack of overt agreement and *wh*-phrases licensed as indefinites, shared by MC and Cantonese, constructions like the one in (157) with *meiyou-shei* as one constituent in preverbal position leads to ungrammaticality.

157.	*Wo	meiyou-shei$_i$	xihuan t_i
	I	no-who	like

‘I like nobody.’

Instead, examples (158) and (159) are the preferred structures for negative interpretations in MC.

158.	Wo	shei$_i$	dou	bu	xihuan.
	I	who	all	not	like

‘I don’t like anybody.’

159.	Wo	meiyou	xihuan	de	ren.
	I	no	like	DE	people

‘I like nobody.’ (Lit. ‘There is not a person that I like.’)

Diesing (1992) suggests that all “strong quantifiers” are required to undergo QR. I follow that NegQs and Neg-whQs undergo obligatory and overt raising.

160.	Ngo	[*moujan*/*mou-bingo*]$_i$	soeng	gin t_i
	I	nobody/ no-who	want	meet

‘I want to meet nobody.’

As for spoken Cantonese, the raised Neg-whQ$_{obj}$ in SOV structures is not only restricted to a negative interpretation. As illustrated in the section above, a raised Neg-whQ$_{obj}$ constructions has both a non-existential presupposition and an existential presupposition depending on context. Both interpretations are also available in negated contexts. According to Chomsky’s Full Interpretation (FI) (1986), Neg-whQs$_{obj}$ have to undergo overt movement to preverbal position in order to receive both quantificational readings. In contrast to the option movement of indefinite negative quantifiers in Icelandic and Danish, QR is an obligatory requirement to receive both interpretations and maintain grammaticality in Cantonese.

161. Ngo *mou-matje*$_i$ soeng sik t_i (ge3).
I no-what want eat (SP)
a. 'I want to eat nothing.' (Lit. 'I don't want to eat anything.')
b. 'I only want to eat a few things.'

162. Ngo *mou-matje*$_i$ m sik t_i (ge3).
I no-what not eat (SP)
a. 'I don't eat anything.' (Lit. 'There is nothing that I don't eat.')
b. 'I don't eat only a few things.'

The difference between (161) and (162) is merely the presence or absence of the negator *m* 'not', which determines the availability or not of a sentential negation interpretation. That is, where the negator *m* is absent, the raised *mou-matje* in preverbal position gives rise to the negative '…nothing'/ 'not…anything' interpretation in (161); when negator *m* is present, double negation cancels out the negative interpretation such that 'nothing…don't eat' entails 'eat…something' in (162). However, whether or not the negator is present, the existential 'only a few' interpretation is also available. The reading of 'only a few…not eat' entails 'there is something…not eat' and 'only a few…eat' entails 'there is something…eat'. That is, the existential 'only a few' reading of Neg-whQs does not preclude the negative presupposition in double negated contexts as above. In this case, Cantonese Neg-whQs like most Romance n-words and even the most relaxed variety of French *personne* 'nobody' (for details see Giannakidou, 2002), in being able to be used in nonnegative contexts without giving a negative interpretation. The following example in French shows that 'n-words are at best ambiguous between a negative and a non-negative, existential meaning' (Giannakidou, 2002, p.30).

163. Est-ce que tu a vu personne? (Giannakidou, 2002, p.30, (95))
Is this that you has seen nobody
a. 'Did you see anybody?'
b. 'Is it true that you saw nobody?'

Literature has suggested that QR is required for an antecedent-contained deletion (ACD) (May, 1985; Kennedy, 1997) in LF where ACD construction is a condition of grammaticality. With reference to Kennedy, “the principles that force LF movement of lexical material are essentially the same as those that force overt (PF) movement” (1997, pp. 684 – 685).

164. I read every book that you did. (Diesing, 1992, p. 70, (25a))

165. Max put everything he could in his pockets. (Diesing, 1992, p. 70, (25d))

VP-ellipsis is marked by the verb *do* in English. Copying the elided VP and replacing it with *did* recovers the deletion as in (164). It can also be marked by the modal *could* and again copying the elided VP after *could* can recover the deletion as in (165). Data on ACD in Cantonese is provided in (166 – 167) to argue for the possible claim that the overt and obligatory raising of Neg-whQs$_{obj}$ is possibly a kind of QR in syntax.

166.	Nei	jau/hoji	zou	mui	gin ngo	dou	jau/hoji <zou >	ge	si.
	you	have/can	do	every	CL I	also	have/can <do>	GE	thing

‘You have done/can do everything that I also have <done>/can <do>.’

167.	John	sik	ge	tong	haai	ngo	paitzeun	kui <sik>	ge3.
	John	eat	GE	candies	be	I	permit	him	SP

‘The candies John eats, is what I permit him to <eat>.’

On the one hand, VP-ellipses in Cantonese are marked by modal verbs like *jau* ‘have’ and *hoji* ‘can’ as with the universal quantified classifier *mui gin* ‘every’ in (166); and when IP is filled with a preceding verbs such as *haai* ‘be’ as in (167).

168. Ta xihuan Zhangsan. Wo ye shi. (Soh, 2005, p.10, (21a))
he like Zhangsan I also be
'He likes Zhangsan. I do too.'

169. Ta neng zuo mei-jian wo bu neng de shi.(Soh, 2005, p.10, (22))
he can do every-CL I not can DE thing
'He can do everything that I cannot.'

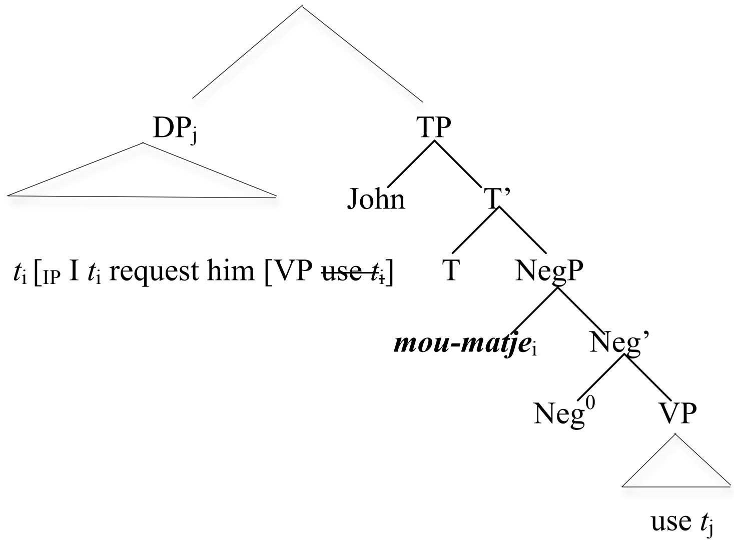
This is on a par with MC, where, on the other hand, VP-ellipsis is marked after the verb *shi* 'be' as in (168) and the presence of modal verbs like *neng* 'can' or *gan* 'dare to' is required in ACD constructions involving a relative clause in MC as in (169) (Soh, 2005, p.10). I argue that overt quantifier raising of Neg-whQs$_{obj}$ as a type of *wh*-quantifier in Cantonese survives in ACD.

170. Ngo [$_{vP}$ [*mou-matje*]$_i$ [$_{VP}$ jiu maai t_i]] (ji) nei dou jiu <maai t_i> ze1.
I no-what have to buy (that) you also have to buy SP
'I have to buy only a few things that you also have to <buy>.'

171. John [$_{vP}$ [*mou-matje*]$_i$ [$_{VP}$ jung t_i]] ngo jiukou kui <jung t_i> ze1.
John no-what use I request him use SP
'John uses only a few things I ask him to <use>.'

In both (170) and (171), the deletion of VP is contained within the vP after NP as a consequence of overt QR. Note that the two examples end with the SP *ze1*, which has a [+p] feature, and therefore the existential 'only a few' reading of Neg-whQ is pushed. Deletion is recovered by copying its antecedent VP and the grammaticality of the sentences is maintained without producing infinite regress. Taking this into account, overt QR yields the LF presentation of (172) where the stroke-through elements represent the elided VP.

172.



173. Ngo [*mou-matje*]$_i$ [$_{vP}$ jiu [$_{VP}$baai t_i haait go zoeng toi soengmin]$_j$] ji nei jiu Ø$_j$ ge3.
I no-what need put on that CL table above but you need SP
a. 'I have to put nothing on the table but you have to (put things on the table).'
b. 'I only have to put a few things on the table as you have to (put things on the table).'

174. Ngo [*mou-matje*]$_i$ [$_{vP}$ jiu [$_{VP}$ baai t_i haait go zoeng]$_j$] nei jiu Ø$_j$ ge toi soengmin.
I no-what need put on that CL you need GE table above
a. 'I need to put nothing on that table which you have to (put things on).'
b. 'I only have to put a few things on that table which you have to (put things on).'

Overt QR of Neg-whQs can also account for data on adjunct ACD in coordinated constructions as in (173) and constructions with relative clauses as in (174). In both cases, the Neg-whQs move out of the VP to a position preceding the matrix verb. The deletion can be recovered by copying the antecedent VP, and grammaticality can still be maintained.

3.6.3. OPTIONAL LONG-DISTANCE MOVEMENT OF NEG-WHQS

The above sections have shown that the obligatory raising of the Neg-whQ$_{obj}$ to preverbal position in Cantonese is a consequence of overt QR, suggesting the idea that Neg-whQs move along as a whole constituent. This section focuses the investigation of possible movement of Neg-whQs$_{obj}$ possible after obligatory and overt raising, and suggest a similarity exists between Neg-whQs and ordinary DPs in Cantonese with left dislocations.[8]

175. ___ Mary ___ waa ___ nei *mou-matje*$_i$ zungji sik t_i

Mary say you no-what like eat

a. 'Mary says you like to eat nothing.'

b. 'There is nothing that Mary says you like to eat.'

As illustrated in (175), the Neg-whQ *mou-matje* can further be raised to any pre-subject and preverbal position following obligatory and overt raising. The gaps indicate possible landing sites for this optional successive movement. Optional movements of Neg-whQs change the focus of the constructions. Long-distance movement of Neg-whQs$_{obj}$ leads to a wide scope.

176. *Ngo *mou-bingo*$_i$ gotdak t_i nei t_i gin-guo

I no-who think you meet-ASP

'Only a few people, I think that you have met.'

177. Ngo *mou-bingo*$_i$ gotdak t_i nei t_i gin-guo keoi(dei)

I no-who think you meet-ASP him/her/them

'Only a few people, I think that you have met them.'

---

[8] This optional long distance movement is subject to an island effect when the embedded clause is marked finite.

e.g. * Mary [*mou-matje*]$_i$ waa [$_{CP}$ nei maai-zo t_i]

Mary no what say you buy-ASP

'Mary says you bought nothing.'

A strong islandhood (Chomsky, 1986; Ross, 1967) is observed when the embedded clause is marked by finite morphology. Cheung (1997) and Law (2003) provide data showing that movement of fronted phrases to the left (Left Dislocation) is sensitive to island constraints. Ungrammaticality is observed in (176) with the verb marked by the past tense marker–*zo* in the subordinate clause. This is on a par with *wh*-movements in Chomsky (1986) and Manzini (1992), whereby, any optional movement is blocked when the embedded clause is overtly marked finite by the aspect marker *–guo* or *–zo* attached to the verb.

178. *Tensed IP is an inherent barrier (possibly weak) to wh-movement, this effect being restricted to the most deeply embedded tensed IP.*

(Chomsky, 1986, p.37)

179. *[+Tense] on T blocks an (Address-based) sequence between a wh-phrase and its trace, but [-Tense] on T does not block it.*

(Manzini, 1992)

Optional further raising from the embedded clause is forbidden unless a resumptive pronoun is present (Aoun, Choueiri, and Hornstein, 2001) and the ungrammaticality of (176) is loosened with the resumptive pronoun *keoi* 'him' in (177).

To summarise, I have included in this section evidence that Cantonese Neg-whQs undergo overt raising as strong quantifiers do in Hungarian, French and Scandinavian languages. Cantonese data regarding ACD constructions suggest this overt raising to be QR. The drives for overt QR are to maintain grammaticality and to obtain full quantificational interpretations, both existential and non-existential presuppositions. In addition, Neg-whQs$_{obj}$ can be dislocated by undergoing further movements to change focus of constructions. Further movements are subject to an island effect and ungrammaticality can be rescued by resumptive pronouns.

3.6.4. NEG-WHQS IN DOUBLY QUANTIFIED CONSTRUCTIONS

Within doubly quantified constructions, taking scope of Neg-whQ obeys its surface structure and does not seem to undergo further covert movement at LF. Unlike a construction involving double quantifiers in English, which often leads to scope ambiguity (Jackendoff, 1972; May, 1977; among others), there is no ambiguity in constructions where double quantifiers interact in Cantonese. For example, when a universal quantifier interacts with an existential quantifier, either a collective or distributive interpretation survives depending on the c-commanding relationship between the two quantifiers. Aoun and Li (1989, 1993) and Huang (1982) proposed that Chinese exhibits scope rigidity whereby inverse scope interpretation is disallowed in doubly quantified constructions in Chinese. According to Hornstein's (1995) Scope Principle, scope taking can only apply to overt syntax and that covert quantifier raising is blocked by overt quantifier raising in Cantonese.

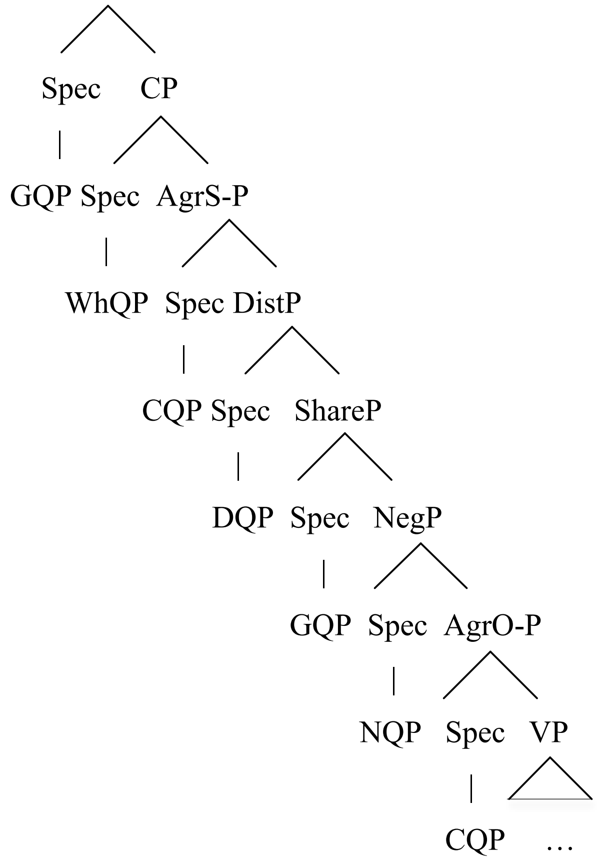
180. *Scope Principle*

A quantified argument Q1 takes scope over a quantified argument argument Q2 iff Q1 c-commands Q2 [at LF].

(Hornstein, 1995, p.154)

I assume account that the target landing site of universal quantifiers 'every-' are [Spec, DistP] (distributive reading), of existential quantifiers 'some-' are [Spec, RefP] (wide scope reading) and [Spec, ShareP] (narrow scope reading). Landing site for negative quantifiers are [Spec, NegP] where they check their respective logico-semantic features (Bagehelli and Stowell, 1997). Structure (108) of Bagehelli and Stowell's (1997, p.76, (2)) is repeated in (181).

181. RefP (Bagehelli and Stowell, 1997, p.76, (2))



A doubly quantified construction with the interaction of a universal quantifier and an existential quantifier leads to ambiguity in English below:

182. Everyone loves someone. (Huang, 1994, p.130, (11))

a. [$_{IP}$ Everyone$_i$ [$_{IP}$ Someone$_j$ [$_{IP}$ t_i loves t_j] (Huang, 1994, p.130, (12))

b. [$_{IP}$ Someone$_j$ [$_{IP}$ Everyone$_i$ [$_{IP}$ t_i loves t_j] (Huang, 1994, p.130, (13))

However, no ambiguity is observed with doubly quantified constructions in Chinese in (183) and its scrambled form in (184).

183. Meige xuesheng dou mai-le yiben shu. (Huang, 1982, p.112, (3))
every student all buy-ASP one book
'Every student bought one book.'
('For every student x, there is one book y such that x bought y.')

184. You yiben shu meige xuesheng dou mai-le. (Huang, 1982, p.112, (4))
have one book every student all buy-ASP
'There is one book that every student bought.'

Only the subject *meige zuesheng* 'every student' takes wide scope over the object *yiben shu* 'one book' in (183) where it precedes the object, whereas only the object *yiben shu* 'one book' takes wide scope over the subject *meige xuesheng* 'every student' in (184) where the object is scrambled to the front.

The difference between English and MC regarding doubly quantified constructions, is that both subject over object (S>O) and object over subject (O>S) interpretations are available in English due to covert QR at LF as represented in (182a–b), while such ambiguity is not observed in MC as in (182 – 183) where NPs are subject to scrambling. According to Cheng (1993), *dou* only occurs preverbally and quantifies NP appears on its left; it constraints a quantifier within which it can take scope and restrict its ability to raise to a position outside its government domain (see more in Li, 1992; Aoun and Li, 1993). Cantonese NPs are also subject to scrambling and taking scope is on a par with MC in constructions with doubly quantified constructions as in (185 – 186).

185. Muigo hoksan dou maai-zo jat bun syu. (Subject-wide scope)
every student all buy-ASP one CL book
'Every student bought a book.'
('For every student x, there is one book y such that x bought y.')

186. [Jau jat bun syu]$_i$ muigo hoksan dou maai-zo t_i. (Object-wide scope)
have one CL book every student all buy-ASP
'There is one book that every student bought.'

Examples (187) and (188) review the unambiguous interpretation in doubly quantified constructions involving a Neg-whQ_{subj} and a $\forall_{obj}$:

187. *Mou-bingo* muijoeng-je dou seong sik. (Neg-whQ>$\forall$, *$\forall$>Neg-whQ)
no-who$_{subj}$ every-thing$_{obj}$ all want eat
'Nobody wants to eat all the thing.'

188. [Muijoeng-je dou]$_i$ *mou-bingo* t_i soeng sik. ($\forall$>Neg-whQ, *Neg-whQ>$\forall$)
every-thing$_{obj}$ all no-who$_{subj}$ want eat
a. 'For each thing x, nobody wants to eat x'
(Lit. Nobody wants to eat anything at all.')
b. 'For each thing x, there is only a few people who want to eat x.'

In a construction like (187), a Neg-whQ in the subject position interacts with a universal quantifier in the object position. The only available interpretation is where the Neg-whQ_{subj} *mou-bingo* takes scope over the $\forall_{obj}$ *muijoeng-je* 'everything' and leads to a collective reading. After scrambling (188), the Neg-whQ_{subj} taking scope over the $\forall_{obj}$ interpretation is not preserved but the $\forall_{obj}$ taking scope over the Neg-whQ_{subj} interpretation does survive. The $\forall_{obj}$ *muijoeng-je* gives rise to distributive reading only as 'each thing' as a result of taking wide scope in overt syntax. The negative readings of both constructions differ in their exclusion of facts. The collective negative reading in (187) excludes the case of a single person who eats the entire thing, whereas the distributive negative reading in (188a) excludes the action for anybody wanting to eat anything at all. However, there is a clear difference between the two regarding the availability of the additional existential 'only a few' interpretation of Neg-whQ in doubly quantified constructions as in (188b). In scrambling constructions where the Neg-whQ_{subj} is preceded by the $\forall_{obj}$, taking scope observes the surface structure, with the Neg-whQ_{subj} only being able to take a narrow scope. The additional existential reading is only available where the Neg-whQ_{subj} take a narrow scope being preceded by the $\forall_{obj}$ in surface structure.

In contrast, doubly quantified constructions with a negative quantifier subject and a universal quantifier object are readily ambiguous between the collective and distributive readings in English (189).

189. Nobody eats every sandwich. (NegQ>$\forall$, $\forall$>NegQ)

a. NegQ>$\forall$ (Collective reading):

There is not a person x and there are sandwiches y, such that x eats all of y.

(In other words, 'Nobody eats all the sandwiches, but somebody eats at least one of them.')

b. $\forall$>NegQ (Distributive reading):

For each sandwich y, such that there is not a person who eats y.

(In other words, 'Nobody eats any sandwiches at all.')

'Scrambling' in taking scope is available covertly in English. Both NegQ>$\forall$ and $\forall$>NegQ readings are in principle available. However, the ambiguity seems to vanish when a universal quantified NP is in a direct object position. The NegQ>$\forall$ interpretation appears to be more pragmatically natural in English. Therefore, English LF scope also matches surface scope when a $NegQ_{subj}$ interacts with $\forall_{obj}$, when compared to its counterpart (187) in Cantonese. Note the reading in (189a) excludes the fact that somebody eats all the sandwiches, however, it does not exclude the fact that somebody might eat some of the sandwiches.

The following data reviews the unambiguous interpretation in doubly quantified constructions involving a $\forall_{subj}$ and a $NegQ_{obj}$ instead:

190. Everybody bought nothing.

(In other words, 'nobody bought anything at all.')

Taking scope is restricted only to a negative reading and has no existential entailment in English when the universal quantifier precedes a NegQ.

191. Muigojan dou *mou-matje*$_i$ maai-zo t_i . ($\forall$>Neg-whQ, *Neg-whQ>$\forall$)

everyone$_{subj}$ all no-who$_{obj}$ buy-ASP

a. 'Every one bought nothing.' (Lit. 'Each one of them bought nothing.')

b. 'Every one bought only a few things.' (Lit. 'Each one of them bought only a few things.')

192. *Mou-matje*$_i$, muigojan dou t_i maai-zo t_i. (Neg-whQ>$\forall$, *$\forall$>Neg-whQ)

no-what$_{obj}$ everyone$_{subj}$ all buy-ASP

'There is nothing, that everyone bought.'

Regarding constructions with the interaction of a $\forall_{subj}$ and a Neg-whQ$_{obj}$ in (191), only the $\forall_{subj}$ can take scope over the Neg-whQ$_{obj}$. In such constructions, ambiguity is ruled out and both the negative and existential interpretation are available by virtue of the Neg-whQ$_{obj}$ undergoing obligatory overt raising and its internal structure being subject to decomposition. However, ambiguity in these constructions dies out when the Neg-whQ$_{obj}$ is scrambled to the front as in (192). Decomposition takes place only after the scrambling of the Neg-whQ$_{obj}$ as one constituent and the double negated context for the extra existential reading of the Neg-whQ$_{obj}$ is not available in the syntactic highest structure of a sentence (e.g. FocusP or TopicP). The Neg-whQ$_{obj}$ can only take wide scope in (192), leading to the negative interpretation only.

193. Every sandwich is not eaten by anybody.

194. ?Every sandwich is eaten by nobody.

In English, even when a construction with a negative subject and an object universal quantified NP is passivized as in (193 – 194), there is no ambiguity but, only a negative *not eating anything* interpretation. Note that a subject negative quantifier does not seem to survive in a passive sentence like (194).

In summary, there is no ambiguity regarding subject over object and object over subject scope readings in Cantonese doubly quantified constructions. Regardless of their syntactic function, each quantifier, which is capable to bind in surface structure, takes scope over the other quantifier. No ambiguity is observed and only the negative interpretation is available where a Neg-whQ precedes a ∀, whereas the ambiguity is observed when a ∀ precedes a Neg-whQ. Simply, the ambiguity arises from the fact that both negative and existential reading of Neg-whQs are triggered when Neg-whQs in preverbal position in overt syntax, in which the case the observed overt QR blocks covert movement at LF.

3.7. APPLYING THE PROPOSED (NEG-*WH*)QP

In this section, I illustrate how the overt movements involved in Neg-whQs$_{obj}$ in dative and infinitival constructions can account for NPI licensing and weak crossover (WCO) cancellation data.

3.7.1. LICENSING NPI IN DATIVE CONSTRUCTIONS

I discussed in a previous chapter the licensing of *wh*-words as indefinites in MC, and how Cantonese *wh*-words are licensed in a similar way. In Cantonese, *wh*-words are licensed as NPI. Neg-whQs can be decomposed into a negation and an indefinite: the resulting structure allows both the overt QR of Neg-whQs with negative and existential interpretations, and the optional Neg-raising with only the negative interpretation. The proposed overt movement of Neg-whQs can also license another NPI or another *wh*-word as NPI or in dative constructions, where the NPI/*wh*-word is the direct object and the Neg-whQ is an indirect object which has undergone raising to preverbal position.

The two constructions in (195 – 196) are ungrammatical where the Neg-whQ *mou-bingo* does not undergo overt raising. These constructions in the following is ungrammatical because the NPI *jamhojan* is not licensed by a preceding negation in (195) and *wh*-phrase is not licensed as NPI in a declarative in (196).

195. *Ngo gaaisiu jamhojan bei *mou-bingo.*
I introduce anyone$_{[NPI]}$ to no-who
*‘I introduce anyone to nobody.’

196. *Ngo gaaisiu bingo bei *mou-bingo.* / *aa?*
I introduce who to no-who SP
*'I introduce anyone to nobody.' OR *'Who do I introduce to nobody?'

Overt raising of Neg-whQ$_{obj}$ not only leads to grammaticality, as in (197 – 198), but also leads to the correct interpretations where the NPI *jamhojan*/*bingo* ('anyone'/'who') as the direct object in dative construction is licensed as a NPI.

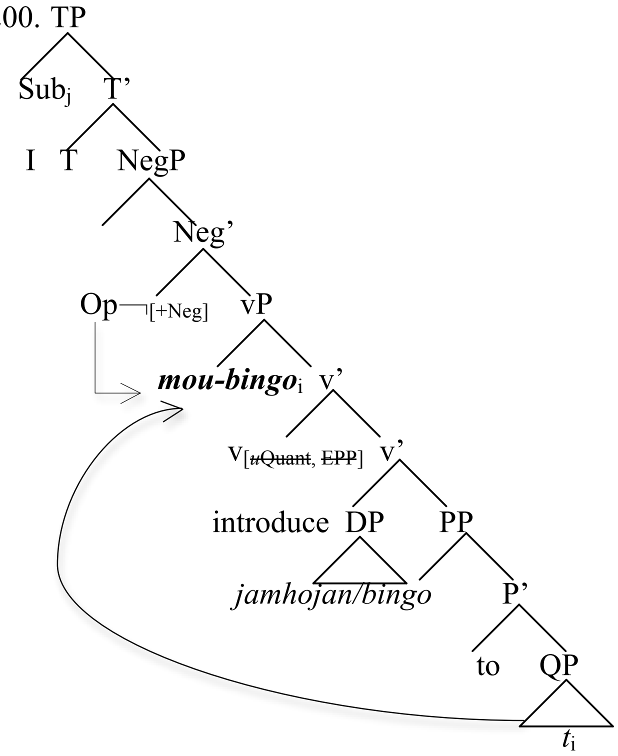
197. Ngo *mou-bingo*$_i$ gaaisiu jamhojan bei t_i.
I no-who introduce anyone to
'Nobody, I introduce anyone to.' (Lit. 'I do not introduce anyone to anyone.')

198. Ngo *mou-bingo*$_i$ gaaisiu bingo bei t_i ↗?/↘.
I no-who introduce who to
a. ?'Who do I not introduce to anybody?' or
?'Who do I introduce to only a few people?'
b. 'Nobody, I introduce anybody to.' (Lit. 'I do not introduce someone to anyone.')

199. Ngo *mou*$_i$ gaaisiu bingo bei [t_i *bingo*] aa3?
I no introduce who to who SP
'Who do I not introduce to anyone?'

Without the presence of SPs, a sentence like (198) can be interrogative with a rising tone and declarative with a lowering tone at the end of the sentence. Both interrogative (198a) and declarative interpretations (198b) survive with overt Neg-whQ movement. However, the interrogative interpretation is not commonly used in this construction because the construction that uses optional Neg-raising is preferred as shown in (199). In this structure, overt movement of the Neg-whQ$_{obj}$ preserves the licensor-licensee relationship as shown in (200).

200.



The Neg-whQ_{obj} *mou-bingo* c-commands neither the NPI *jamhojan* nor the other *wh*-word *bingo* in situ-within the PP. In the above representation, the probes v and Neg_0 trigger the goal QP to raise, check and delete the [uQuant] and the EPP features at [Spec, vP]. The grammaticality is preserved. The Neg-whQ_{obj} *mou-bingo* landing at [Spec, vP] gives it a hierarchically higher position above the direct object (NPI/*wh*-word) where it c-commands it and preserves the licensor-licensee relationship. The direct object *jamhojan* or *wh*-word is licensed as NPI 'anything' resulting in a correct interpretation.

3.7.2. LICENSING NPI IN CONSTRUCTIONS WITH INFINITIVE CLAUSES

I will now continue to look at licensing NPI/*wh*-word in constructions with infinitive clauses, where the object of the main verb is either an NPI or a *wh*-word and the object of the verb within the infinitive clause is a Neg-whQ. Grammaticality and correct interpretation are preserved if the overt and obligatory movement occurs. Constructions in (201 – 202) are ungrammatical where the Neg-whQ_{obj} stays in the post-verbal position in the infinitive clause. In addition, the NPI is not licensed and the *wh*-word takes higher scope over the Neg-whQ_{obj} leading to a poor interrogative interpretation.

201. *Ngo daai jamhojan hui gin *mou-bingo.*
I bring anyone to meet no-who
*'I bring anyone to meet nobody.'

202. *Ngo daai bingo hui gin *mou-bingo* ↗?/↘.
I bring who to meet no-who
a. ?'Who do I bring to meet nobody?'
b. ?'I bring anyone to meet nobody.'

However, the overt movement saves the grammaticality as in the following:

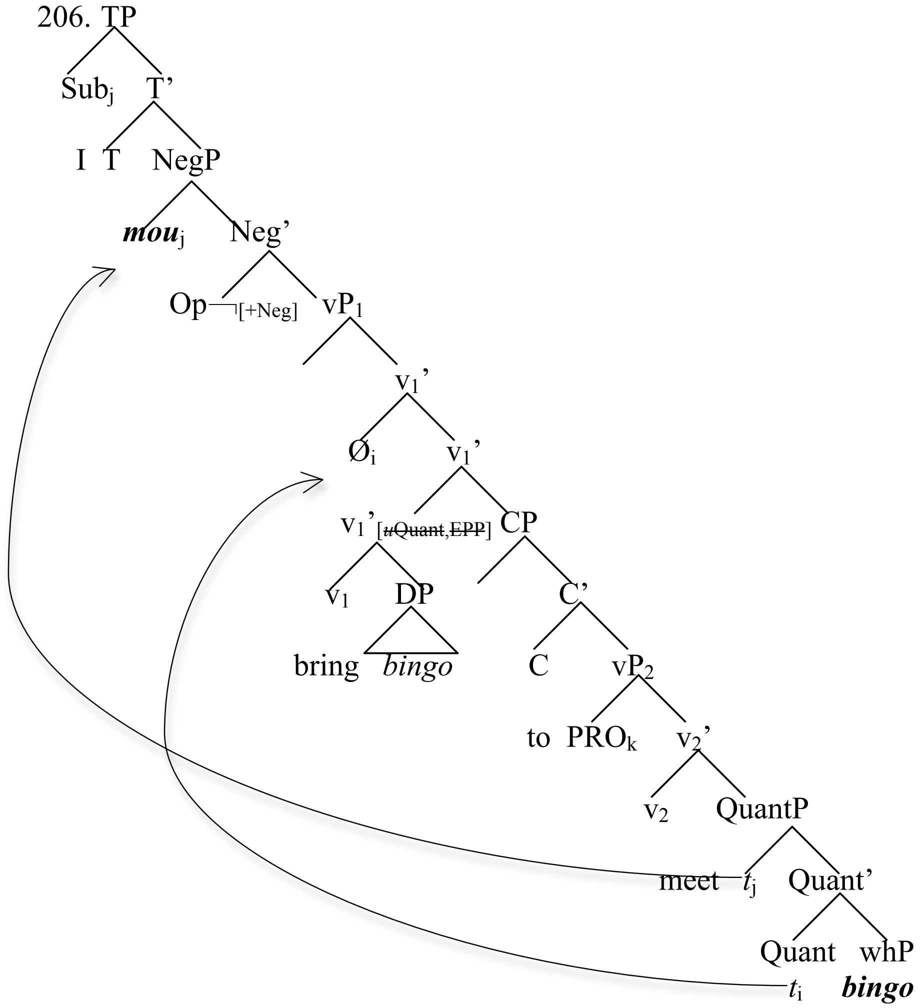
203. Ngo *mou-bingo*$_i$ daai jamhojan hui gin t_i.
I no-who bring anyone to meet
'Nobody, I bring anyone to meet.' (Lit. 'I do not bring anyone to meet anyone.')

204. Ngo *mou-bingo*$_i$ daai bingo hui gin t_i ↗?/↘.
I no-who bring who to meet
a. 'Who do I not bring to meet anyone?' or
'Who do I bring to meet only a few people?'
b. 'Nobody, I bring anyone to meet.' (Lit. 'I do not bring anyone to meet anyone.')

The Neg-whQ$_{obj}$ taking a wide scope now allows the NPI *jamhojan* ('anyone') to be licensed in (203) and renders both interrogative and declarative interpretations in (204). In (204), the interrogative interpretation is preserved where the Neg-whQ$_{obj}$ *mou-bingo* can be decomposed, putting forth the sentential negation interpretation and the fact that the Neg-whQ$_{obj}$ can be triggered as existential 'only a few' interpretation in preverbal position. In addition, the declarative interpretation is also preserved where the object *wh*-word of the matrix verb is now licensed as NPI, because the raised Neg-whQ$_{obj}$ *mou-bingo* c-commands it in the pre- matrix verb position. As proposed, the structure accounts for the optional Neg-raising. The representation (206) explains that the ambiguity arises from the overt raising of *mou* from QP in sentences like (205).

205. Ngo *mou*$_i$ daai bingo hui gin [$_{QP}$ t_i *bingo*] ↗?/↘.
I no bring who to meet who
a. 'Who do I not bring anyone to meet?'
b. 'Who do I not bring to meet anyone?'
c. 'I don't bring anyone to meet anyone.'

206.



The QP is decomposed when the optional Neg-raising applies and the probes attract the goals under Agree. The feature sets of v and the invisible quantifier operator Ø within QP match which drives obligatory QR targeting the landing site at [Spec, vP] while the feature sets of Neg and the negative morpheme *mou* within QP driving Neg-raising which targets the landing site at [Spec, NegP]. The negation has a wide scope and two *wh*-words are within its c-command domain. In declarative sentences depending on the tone, the negative morpheme *mou* can license both *wh*-words as NPI and lead to the interpretation of (205c). When a question particle (*aa3* for example) or a rising tone is present, both *wh*-words can be interrogative, so that one *bingo* is licensed as NPI, while the other remains to be questioned, leading to ambiguity between (205a) and (205b).

3.7.3. CANCELLING WCO IN DATIVE CONSTRUCTIONS

The proposed overt movement preserves grammaticality by cancelling WCO when a pronoun in a direct object position is co-indexed and c-commanded by the raised indirect object. WCO cannot be cancelled when a pronoun in the direct object is co-indexed with the indirect object if the indirect object needs not to be raised in a dative construction.

207. Ngo sung $keoi_{*i/j}$ zigei buin syu bei $SiuMing_i$.
I gift [his own CL $book]_{direct}$ to $SiuMing_{indirect}$
'I gave as a gift $his_{*i/j}$ own book to $SiuMing_i$.'

208. *Ngo sung $keoi_{*i/j}$ zigei buin syu bei *mou-bingo*$_i$.
I gift [his own CL $book]_{direct}$ to $no\text{-}who_{indirect}$
'I give as a gift $his_{*i/j}$ own book to $nobody_i$.'

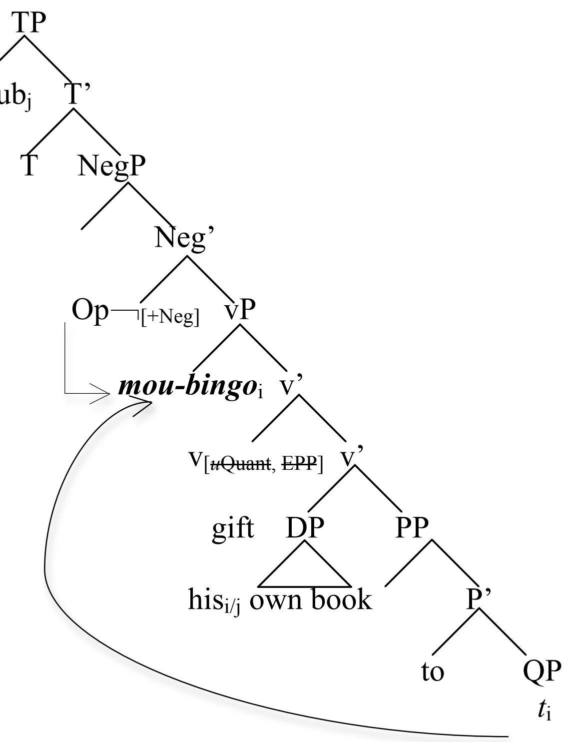
In dative construction as in (207), the pronoun within the direct object can never co-index with the indirect object due to a weak crossover effect. Therefore, the Neg-whQ construction in (208) is also ungrammatical.

209. Ngo *mou-bingo*$_i$ sung $kui_{i/j}$ zigei buin syu bei t_i.
I $no\text{-}who_{indirect}$ gift [his own CL $book]_{direct}$ to
'$Nobody_i$, I give as a gift his_i own book to.'

However, the weak crossover effect is cancelled when overt raising of the Neg-whQ *mou-bingo* applies. The grammaticality of the sentence in (209) is preserved and

WCO is also cancelled when the Neg-whQ and the pronoun within the direct object are co-indexed. This is further explained in representation (210).

210.



The uninterpretable and EPP features in v probe the Neg-whQ to land at [Spec, vP] to value [*u*Quant]. After applying overt movement, the Neg-whQ *mou-bingo* is lands in a c-commanding position c-commanded by the pronoun *keoi* 'his' and WCO can be cancelled when they co-index.

3.7.4. CANCELLING WCO IN CONSTRUCTIONS WITH INFINITIVE CLAUSES

The cancelling of WCO also applies, when the Neg-whQ is the complement of the verb within the infinitival and the pronoun is within the scope of the direct object.

211. *Ngo	daai	[keoi$_{*i/j}$ aa ma]	hui	gin	*mou-bingo*$_i$.
I	bring	[his mother]$_{direct}$	to	meet	no-who$_{indirect}$

'I bring his$_{*i/j}$ mother to meet nobody$_i$.'

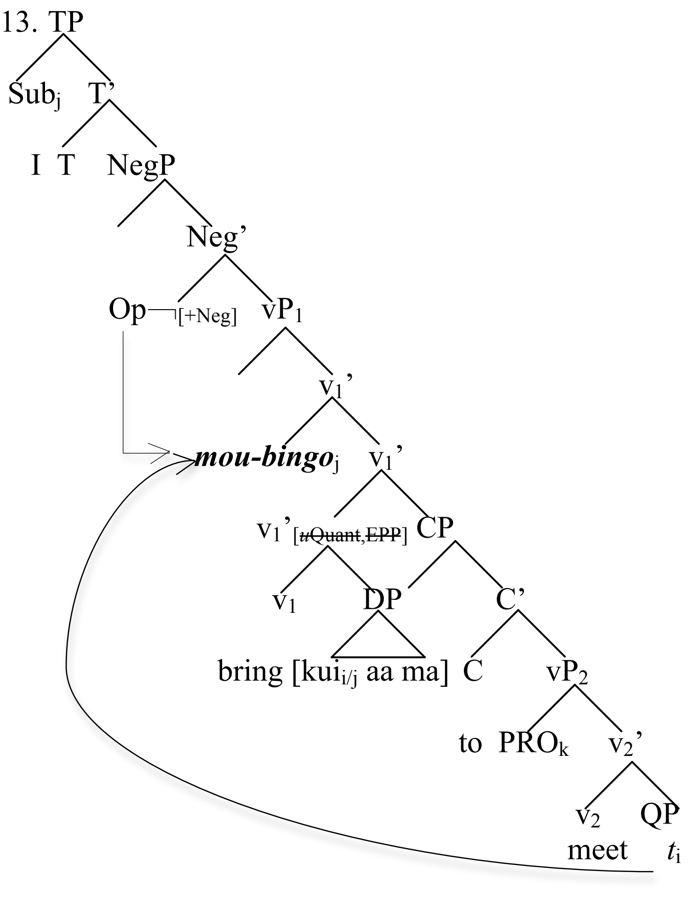
212. Ngo *mou-bingo*$_i$ daai [keoi$_i$ aa ma] hui gin *t*$_i$.

I no-who$_{indirect}$ bring [his mother]$_{direct}$ to meet

'Nobody$_i$, I bring his$_{i/j}$ mother to meet.'

The ungrammaticality in (211) can be preserved with the overt raising as in (212). Similar to the discussion in the previous section, where constructions with the Neg-whQ *mou-bingo* and the pronoun *kui* being co-indexed was discussed, the WCO is now cancelled after overt movement, and the Neg-whQ can successfully binds the pronoun as illustrated in the representation in (213):

213.



The Neg-whQ *mou-bingo* as the object of the infinitive clause undergoes overt raising and lands at [Spec, vP]. Checking and deleting the EPP [*u*Quant] preserve grammaticality. In addition, obligatory movement allows the Neg-whQ to land in a position where binding of the pronoun is possible, and WCO cancels while the Neg-whQ and the pronoun co-index.

3.7.5. ACCOUNTING FOR DOUBLE QUANTIFIERS IN DATIVE CONSTRUCTIONS

As discussed earlier, strong quantifiers in Cantonese undergo overt and obligatory raising. Overt movement of Neg-whQs either as direct or indirect objects in dative constructions with double quantified objects create nested paths with no crossing, and grammaticality is preserved. Such A-dependencies seem to resemble A'-dependencies according to May's (1985) Path Containment Condition and to Tanakas's (1997, 1998) Linear Crossing Constraint.

214. *Path Containment Condition*: (May, 1985, p.118 (6))
Intersecting A'-categorial paths must embed, not overlap.

215. *Linear Crossing Constraint (LCC)*: (Tanaka, 1997, 2003)
Two overlapping A'dependencies may not overlap.

216. Ngo [muigojan]$_j$ dou [*mou-bingo*]$_i$ gaaisiu t_i bei t_j.
I everyone$_{indirect}$ also no-who$_{direct}$ introduce to
a. 'I introduce nobody to everyone.'
b. 'I introduce only a few people to everyone.'

217. Ngo [*mou-bingo*]$_j$ [muigojan]$_i$ dou gaaisiu t_i bei t_j
I no-who$_{indirect}$ everyone$_{direct}$ also introduce to
a. 'I introduce everyone to nobody.'
b. 'I introduce everyone to only a few people.'

Examples (216 – 217) show that the indirect object quantifier precedes the direct object quantifier when both of them are raised to the preverbal position. The direct object universal quantifier *muigojan* as goal in (216) precedes the direct object Neg-whQ *moubingo* as the theme. Vice versa, the indirect object Neg-whQ as the goal in (217) precedes the direct object universal quantifier as the theme. Neither of the constructions with double quantifiers, as either a direct or indirect object, creates an ungrammatical crossing.

3.7.6. SUMMARY

The proposed structure, argued that the obligatory overt raising is driven by feature set-Agree. Raising Neg-whQ licenses NPI/another *wh*-word as NPI in the direct object/matrix object position and cancels WCO where there is co-indexation with the pronoun in the direct object/matrix object position in dative constructions and constructions within infinitive clause. Other ordinary DPs are impossible without overt movement.

3.8. CONCLUSION

In this chapter, a structure has been proposed to explain the overt and obligatory raising phenomenon in spoken Cantonese, particularly for Neg-whQs as a colloquial term which are combination of a negator *mou* and a *wh*-word (e.g. *mou-bingo* 'no-who', *mou-matje* 'no-what', *mou-bindou* 'no-where'). This chapter is an attempt to unify obligatory and optional movement with elements involving a *wh*-phrase by resorting to Agree, a theory couched within the Minimalist framework. I argued that the SOV structure with Neg-whQ$_{obj}$ constructions are not simply just object scrambling, but overt and obligatory raising of the Neg-whQ$_{obj}$ from the base-generated object position in the canonical SVO word order. Although Mandarin Chinese and Cantonese have common syntactic properties (e.g. canonical SVO order, *wh*-in-situ language and overt QR of strong quantifiers), Neg-whQ$_{obj}$ constructions in an SOV structure occurs only in Cantonese. I followed Chomsky (1995) by claiming that the [*u*Quant] and EPP features at [Spec, vP] trigger obligatory raising of such Neg-whQs. A (Neg-wh)QP was proposed to explain the structure of Neg-whQs as one constituent and how it allows choice optional movement. The (Neg-wh)QP structure takes a negative morpheme *mou* in specifier position, an invisible quantifier operator Ø as the head and any *wh*-words as its complement (any DP for other quantifiers). The QP bears a [Neg] and [Quant:_] and therefore is attracted to [Spec,vP] for checking and deleting uninterpretable features under Agree. It is assumed that Neg-whQs undergo obligatory syntactic mechanisms such as overt movement and decompositions in order to obtain Full Interpretation. The dual interpretation, negative and existential 'only a few' reading, is accounted for by obligatory and overt movement takes place before the decomposition of Neg-whQs. Choice of interpretation is context-dependent. A [p] feature related to SPs at the CP indicates the presupposition of information shared between the speaker and the addressee. The lowering tone or an additional SP with [-p] feature in sentence-final position tends to push the negative reading, whereas a rising tone or an additional SP with [+p] tends to push the existential reading. The absolute negative reading that comes about as a result of Neg-raising, when *wh*-words are licensed as NPI, is accounted for when decomposition takes place before overt movement. Overt raising of Neg-whQs$_{obj}$ licenses NPI/another *wh*-word as NPI and cancels WCO where the Neg-whQ and the pronoun are co-indexed in dative constructions and constructions with infinitive clause. The proposed movement preserves grammaticality of these constructions.

CHAPTER 4

WH-PHRASES AND QUANTIFIER SCOPE IN SECOND LANGUAGE RESEARCH

4.1. INTRODUCTION

The L2 experiment of this thesis explores the potential persistent problems of adult English-speaking learners with Cantonese Neg-whQs. Cantonese, the second most widely used Chinese dialect besides MC, is a spoken language used in many places such as Hong Kong, Guangdong, Singapore and Malaysia. The population speaking Cantonese in formal situations as well as everyday life communication is growing. Moreover, there is a need in learning Cantonese, not only in Hong Kong, but also in many other places, due to the effect of emigration. There is literature on the grammar of MC (written Chinese) but only a small segment has looked at Cantonese grammar, and in particular, the acquisition of Cantonese colloquial terms by L1 English-speaking learners. Thus, learning how Cantonese is spoken and used colloquially is crucial in mastering daily conversations in Cantonese-speaking contexts. Even native Cantonese speakers are only taught standard Chinese in academic settings. Although Cantonese is being increasingly taught in formal settings these days, it is often treated as a phonetic variant of spoken and written Chinese. This L2 study focuses on Neg-whQs$_{obj}$ constructions in SOV word order that are typically absent in MC. While SVO is the canonical word order in Cantonese, Neg-whQs$_{obj}$ are present in SOV structures. Neg-whQs *mou-bingo* 'nobody', *mou-matje* 'nothing' and *mou-bindou* 'nowhere', a combination of the negative morpheme *mou* and a *wh*-phrase, have a dual interpretation by virtue of being ambiguous between negative and existential 'only a few' interpretation. Neg-whQs are less frequently used comparing to many other standard quantifiers and are never brought up in the Cantonese classrooms. For this reason, it is interesting to know how well L2 learners can acquire these colloquial terms given limited input conditions. The preliminary research questions investigated in this thesis are presented in (218 – 220).

218. Can English-speaking learners of Cantonese acquire the syntax and semantics of a Neg-whQ$_{obj}$ construction?

219. Does the absence of a [Quant:_] feature in the learners' L1 English play a role in their acquisition of the dual reading of Cantonese Neg-whQs?

220. Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?

A number of psycholinguistic studies have investigated the critical period hypothesis (Lenneberg, 1967) and claim that full mastery of certain aspects of an L1 grammar is constrained by biological and cognitive maturation before puberty. However, literature has also shown that adult L2 acquisition results in non-native-like competence. L2 studies focusing on morphosyntax have also claimed a critical period in L2 acquisition exists around the age of 16 (Johnson and Newport, 1989; DeKeyser, 2000). This study includes learners who are acquiring Cantonese after puberty and most importantly receive input in colloquial contexts by living in Hong Kong after the age of 20. The main question lays in whether or not these adult learners ultimately master Neg-whQs in late L2 acquisition. The differences between Cantonese and English in terms of Neg-whQs, detailed in Table 2 in Chapter 3, can be characterized as follows: i) Neg-whQs are only limited to 'nowhere' but 'no+who' or 'no+what' are absent in English, ii) Neg-whQs inherit [Neg] and [Quant:_] features in Cantonese whereas the closest equivalent to a Cantonese Neg-whQ in English, namely 'nowhere', involves a [Neg] feature only, and iii) while Neg-whQs$_{obj}$ are found with SOV word order in Cantonese, in English they remain in a canonical SVO. Many L2 studies provide empirical evidence confirming L1 effect at an early stage of L2 acquisition. Some researchers suggest L1 transfer is only limited to lexical categories (Vainikka and Young-Scholten, 1994, 1996); others suggest both lexical and functional categories are available (Schwartz and Sprouse 1994, 1996); yet more suggest only some but not all L1 functional categories transfer (Hoekstra and Hyams, 1998). According to Schwartz and Sprouse's (1994, 1996) Full Transfer/ Full Access (FT/FA) approach, there is full L1 grammar transfer at the beginning of the interlanguage. Restructuring is taking place in interlanguages and is entirely constrained by full access to the universal grammar (UG). While many studies have argued for FT/FA model (see Haznedar, 1997; Yuan, 1998, 2010; Slabakova, 2000), this study revisits the Full Access (FA) of the FT/FA model. Given that there is an absence of [Quant:_] feature, SPs and scrambling properties related to Neg-whQ$_{obj}$ constructions in English, we look at how far English-speaking learners of Cantonese can fully acquire Neg-whQs under the constraints of UG. In contrast, Hawkins and Chan's (1997) Failed Functional Features suggests only those morphosyntactic features that are available in the L1 are acquirable in L2 acquisition. This study does not attempt to test the Failed Functional Features approach. Instead, it will argue that the missing [Quant:_] feature in learners' L1 English would be problematic in fully acquiring one of the two interpretations of Neg-whQs, the additional existential 'only a few', than to halt acquisition of the [Neg] feature present in the L1 grammar. Therefore the [Quant:_] feature plays a pivotal role in successful L2 acquisition.

Apart from looking at the syntax and semantic levels individually, namely that Neg-whQs$_{obj}$ appear in SOV structures and in constructions that have dual interpretation, the present study also looks at the interface level. Neg-whQs involve the syntax-semantics interface because choice of the existential or negative interpretation depends on: i) the interactions of Neg-whQ movement and the presence of an SP in CP; ii) the scope of Neg-whQ$_{subj}$ changes due to scrambling in a doubly quantified construction. Recent studies (Tsimpli and Roussou, 1991; Sorace and Filiaci, 2006; Yuan, 2008, 2010; Dekydtspotter *et al.*, 2001) have suggested that grammatical phenomena at the interface between syntax and other cognitive domains may not be acquirable in L2 acquisition, and that mappings between L1 and L2 grammars affect L2 acquisition. These studies look at L2 acquisition where L1 grammar differs substantially from L2 grammar. Besides fully supporting the full access to UG principles, the literature investigates to what extent L1 is bringing an effect and what leads to delay in L2 acquisition. It is believed that there is parametric variation in lexical items, and in particular, in functional categories (Chomsky, 1986; Ouhalla 1991). It is suggested that the learning difficulty involves the failure to acquire functional categories in the target language when there is no direct mapping of such from learners' L1 grammars (Slabakova, 2008). This study aims to explain possible difficulties in the learning process, in particular the functional categories, Neg and Ø and in the proposed (Neg-*wh*)QP and the mismatch in form and meaning where the existential 'only a few' reading of Neg-whQs is pushed. The dual interpretation of Neg-whQ$_{obj}$ constructions is hard to acquire because it is an interface phenomenon involving syntax and semantics/discourse. The existential – negative alternation, which is context-dependent, is therefore predicted to be difficult to L2 learners of Cantonese.

Given that there is no experimental study related to L2 knowledge of Cantonese Neg-whQs, this chapter introduces a number of related L2 studies that enable the formulation of hypotheses, to be tested in Chapter 6, of potential errors L2 learners may commit. The chapter also reviews previous studies of the acquisition of the L2 quantifiers in Japanese, Chinese and French, which are similar to the Cantonese quantifier constructions included in the main study. Their methodology is credited to apply in this research. Section 4.2 opens the discussion in postulating learning difficulties related to L2 acquisition of Cantonese Neg-whQs folowing a feature-based approach, in particular the absence of the [Quant:_] feature in the learners' L1 English. Section 4.3 discusses Slabakova's Bottleneck Hypothesis (2006, 2008, 2010), which will be adopted in this L2 study and will serve as a basis of for defining the L2 learning difficulty. Section 4.4 presents two previous studies related to the L2 acquisition of *wh*-quantifiers in L2 Chinese and L2 French, which involve grammatical interfaces. Section 4.5 reports two experimental studies related to scope interpretation in doubly quantified construction while section 4.6 summarises the chapter.

4.2. POSTULATING THE LEARNING DIFFICULTY FOLLOWING A FEATURE-BASED APPROACH

To begin with, Neg-whQs are only used in colloquial Cantonese and are never taught or mentioned in the classroom. Therefore, L2 acquisition of Neg-whQs can only rely on positive evidence in the L2 input. Having discussed the differences of Neg-whQs between English and Cantonese, I assume learning difficulty lies in the absence of the [Quant:_] feature and an internal morphology mapping between English *nowhere* (as a result of merge {no, where}) and Cantonese negative *wh*-quantifiers (complex morphology of the (Neg-*wh*)QP structure, as a result of merge {mou, {Ø. *wh*-words}}). Empirical SLA research has suggested that learners who achieve a native-like level of L2 competence rely very much on parameter-resetting from their L1 value to that of the target language (Schwartz and Sprouse, 1994, 1996).

In addition, Schwartz and Sprouse (1994, 1996) suggest even the functional categories with parametric values set to those of learners' L1 are available at the initial stage of SLA. In comparison, Vainikka and Young-Scholten (1994, 1996) claim that functional categories do not transfer in L2 acquisition, but only lexical categories. Instead of just looking at how successful learners are at producing the grammatical sentences in a L2, it is more important to investigate how far learners can differentiate between their L1 and L2 syntactic mechanism. According to Chomsky (1998), "acquiring a language involves at least selection of the features [F], construction of lexical items LEX, and refinement of C_{HL} in one of the possible ways – parameter setting" (p.13). The present study follows Chomsky's more recent Minimalist assumptions that parametric values in different languages differ in the selection of particular features for the assembly of lexical items.

221. *S_0 determines the set {F} of properties ('features') available for language. Each L makes a one-time selection of a subset [F] of {F} and a one-time assembly of [F] as its lexicon LEX, which we can take to be a classical 'list of exceptions,' putting aside further issues.*

(Chomsky, 2001, p. 4)

This study takes the feature-based approach and looks at how features involved in Neg-whQs, namely the [Neg] and [Quant:_] features, play a role in second language acquisition of Neg-whQs in Cantonese. By looking at the presence of [Neg] feature but absence of [Quant:_] feature in L1 English, achieving native-like level of L2 Cantonese depends on the assembly of these features from the L1 Neg-whQ representation to the one required by the L2. Recent studies (Hawkins, 2005; Hawkins and Hattori, 2006; Lardiere, 2005, 2007, 2008) have paid attention to the morphological properties of functional categories in L2 acquisition because the morphosyntactic features of the L1 lexicon constitute at the initial state grammar of L2 acquisition. Lardiere's feature (re-)assembly hypothesis (2008, 2009) proposes that the features' reconfiguration of lexical items is required, from L1 representations into new L2 feature sets of possibly a different lexical representations, in order to account for variability in L2 acquisition. Feature (re-)assembly hypothesis (Lardiere, 2008, 2009) is built on Chomsky's Minimalist assumptions (2001) and is a refined approach of parameter-resetting. Lardiere proposes that interlanguage development is tied to mapping and featuring reassembly. Moreover, building on Schwartz and Sprouse's (1996) FT/FA, the feature (re-)assembly hypothesis suggests that the problem for features assembling in adult L2 acquisition is that: i) a full feature set from learners' L1 has been transferred to their interlanguage; ii) if a feature is not selected in their L1, it is hypothesized so as to be inaccessible for (re)assembling into L2 lexical items.

The study looks at the relation between the features related to Neg-whQs and the mechanism that triggers overt raising in Neg-whQ$_{obj}$ constructions. The overt movement of a Neg-whQ$_{obj}$ is triggered by the *Agree* and *Move* mechanism of the [Quant:_] feature, which is inherited from the invisible quantifier operator Ø within the (Neg-*wh*)QP structure. A Neg-whQ$_{obj}$ is raised to [Spec, vP], then values and deletes [uQuant] in v head. Thus, the possibility of achieving native-like acceptance of the SOV structure as an outcome of overt movement depends on whether or not the [Quant:_] feature is added to the L2 feature set. Another focus of the study is to what extent learners acquire the dual interpretation of Neg-whQ$_{obj}$ constructions at the semantic level. The addition of the [Quant:_] feature to the L2 feature set is supposed to play a role in triggering acquisition of the existential reading. The addition of the [Quant:_] feature is crucial in changing the reading of a doubly quantified construction from a non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V structure to a scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V structure. Finally, due to the absence of the [Quant:_] feature and a one-to-one morphological mapping of a {mou, {Ø. *wh*-words}} structure in the learners' L1 grammar, a deficiency or delay in L2 acquisition of Neg-whQs in Cantonese is postulated.

Following the above feature-based approach, successful L2 acquisition of Neg-whQs is predicted to be linked to the successful addition of the [Quant:_] feature to the L2 Cantonese Neg-whQ feature set. Hawkins (2005) suggests that selecting corresponding features from a learners' native language for the assembly of lexical items in later L2 acquisition can lead to the two conditions in (222).

222. *(a) the feature in question is still available for selection, and just needs input to trigger its selection; (b) the feature is no longer available, there is a critical period for availability after which unused features of a certain type are cleared from the cognitive architecture.*

(Hawkins, 2005, p.124)

The features involved in Neg-whQs in Cantonese are [Neg] and [Quant:_]. In order to investigate adult L2 learners' ability to acquire Neg-whQs, it is crucial to explore the availability of these features in L2 acquisition. The relevant comparison between L1 and L2 for negative quantifiers and Neg-whQs is summarised in Table 7, repeating Table 4:

Table 7: Comparison of Cantonese negative *wh*-quantifiers, Cantonese ordinary negative quantifiers and English negative quantifiers in an object position

	Neg-whQ		NegQ	
Language	Cantonese	English	Cantonese	English
Examples	*mou-bingo* ('no-who'), *mou-matje* ('no-what'), *mou-bindou* ('no-where')	*nowhere,* **no-what,* **no-who*	*moujan* ('no-one'), *mouje* ('nothing'), *mou-deifong* ('nowhere')	*nobody,* *nothing*
Syntactic Features	[Neg] [Quant:_]	[Neg]	[Neg]	[Neg]
Word Order	SOV	SVO	SOV	SVO
Movement	Overt	Covert	Covert	Overt
Interpretation(s)	Sentential negation / existential presupposition 'only a few'	Sentential negation	Sentential negation	Sentential negation

Comparing Neg-whQs in Cantonese NegQs in English, it can be seen that Neg-whQs in Cantonese bear an additional [Quant:_] feature. The [Neg] feature shared between

Cantonese and English results in sentences that are semantically unambiguous and only have a negative interpretation. Since this study looks at adult L2 acquisition, the absence of [Quant:_] feature in L1 Neg-whQ feature set is expected to pose difficulty or delay L2 acquisition of Cantonese Neg-whQs. Neg-whQs are a type of negative quantifier, yet, at the same time, they constitute a superset of NegQs (e.g. *moujan* 'nobody') as they have two underlying readings: negative and existential.

In morphological terms, in Cantonese, the unmarked NegQ is composed of *mou* and any DP, while the marked Neg-whQ is composed of *mou*, an invisible quantifier operator Ø and a *wh*-phrase. According to Wexler and Manzini's (1987) Subset Principle, acquisition of Neg-whQs as a marked value is assumed to be more difficult and slower than its unmarked counterparts. The principle predicts learners' learning strategy always selecting the least inclusive grammar; that is, learners initially map Neg-whQs to English *nowhere* and NegQs because they have a single reading. Notwithstanding the fact that Neg-whQs are a type of negative quantifier in Cantonese, mapping Cantonese Neg-whQs to NegQs in either L1 English or L2 Cantonese does not guarantee full acquisition of Neg-whQs, given the fact that Neg-whQs in Cantonese have dual interpretation: negative and existential. To select beyond the subset relies on the amount of input for a superset value, that is the correct interpretation of Neg-whQs from a superset grammar.

Kim et al. (2009) suggest that acquiring an entirely new property is easier for L2 learners than acquiring something with a close counterpart in the learners' L1. Although there is a close counterpart *nowhere* in the learners' L1, which is also composed of 'no' and '*wh*-word', as well as having a negative reading, Cantonese Neg-whQs have a morphologically more complex structure and dual interpretation that their counterpart in English do not share. While English *nowhere* has a [Neg] feature, Cantonese Neg-whQs have an additional [Quant:_] feature and undergo obligatory movement in a Neg-whQ$_{obj}$ construction. Although one may argue that acquiring Neg-whQs should not lead to any difficulty if learners associate them with NegQs in L2 Cantonese with exposure to input, given there is enough positive evidence of both these elements appearing in obligatory preverbal position, there is rare evidence in the input of the additional existential 'only a few' reading of Neg-whQs. Given that Neg-whQs are colloquial terms used among native speakers, L2 learners are rarely exposed to them.

However, doubly quantified constructions involving a Neg-whQ_{subj} and a $\forall_{obj}$ are predicted to cause difficulty to English-speaking learners in achieving native-like competence. The change in the available readings in a doubly quantified construction as a result of scrambling can be considered to be a poverty-of-the-stimulus (POS) problem. According to Schwartz and Sprouse (2000), the POS refers to "linguistic knowledge…for which no external evidence (i.e., input) is available" (p.172). This concept comes from L1 acquisition. A well-known example of POS in English is one-substitution. Such specific linguistic phenomena cannot be deduced from children's L1 input in the environment that they are exposed to but the innate knowledge is constrained in UG (Hornstein ad Lightfoot, 1981, p.9). The linguistic knowledge involved with the change of readings of a doubly quantified construction involving a Neg-whQ_{subj} from the non-scrambled form to a scrambled form in L2 Cantonese is underdetermined by the learners' L1 grammar and L2 input.

Song and Schwartz (2009) pose the learnability problem of Korean *wh*-constructions with NPIs by L1 English speakers, and suggest the two different interpretations depend on scrambling of the *wh*-phrase. The two interpretations (Song and Schwartz, 2009, p.330 (7)) are presented in (223):

223. a. *amwuto* has scope over *mwues-ul* (→ *mwues-ul* is a wh-indefinite)
Amwuto ***mwues-ul*** sa-ci anh-ass-ni?
anyone **something-**Acc buy-ci $_{\text{NEG-PAST-Q}}$
"didn't anyone buy something?"
b. *mwues-ul* has scope over *amwuto* (→ *mwues-ul is a wh*-interrogative)
Mwues-ul *amwuto* sa-ci anh-ass-ni?
what-ACC anyone buy-ci $_{\text{NEG-PAST-Q}}$
"What didn't anyone buy?"

The object *wh*-phrase in (223a) is interpreted as non-interrogative and results in a *wh*-question reading in a scrambled structure, whereas the *wh*-phrase in (223b) is interpreted as interrogative and results in a yes/no-question reading in a non-scrambled structure. The two readings represent a POS problem due to two main reasons: i) in English *wh*-words are unambiguously interpreted as interrogatives and there is no scrambling; ii) there is rare, if not non-existent, evidence in the input that learners encounter to demonstrate how scrambling alters the interpretation of the

Korean questions. Following Song and Schwartz (2009), L2 acquisition of the dual interpretation of doubly quantified constructions with a Cantonese Neg-whQ_{subj} and $\forall_{obj}$ represents a POS problem for L1-English speaking learners. Positive evidence of this will be very rare and there will be no negative evidence from the input that scrambling of a doubly quantified construction involving a Neg-whQ_{subj} is any different from scrambling of other constructions. Examples (224 – 225) represent constructions with a NegQ_{subj} and a $\forall_{obj}$:

224. Moujan muijoeng-je dou soeng sik.
Nobody every-thing also want toeat
'Nobody wants to eat everything.'

225. Muijoeng-je dou moujan soeng sik.
Every-thing also nobody want to eat
'For each thing x, nobody wants to eat x.'

Scrambling (224) into (225) changes the interpretation from a subject-wide scope to an object-wide scope construction in which the collective reading in (224) becomes distributive in (225) after scrambling. Hence, the scope interpretation correlates with surface word order. However, scrambling a doubly quantified construction with a Neg-whQ_{subj} and $\forall_{obj}$ does not just change the scope taking, but also the availability of the existential 'only a few reading' reading of the Neg-whQ_{subj}. Examples (191 – 192) in Chapter 3 are repeated in (226 – 227).

226. *Mou-bingo* muijoeng-je dou seong sik. (Neg-whQ>$\forall$, *$\forall$>Neg-whQ)
no-who every-thing all want eat
'Nobody wants to eat all the thing.'
(In other words, somebody wants to eat at least something.)

227. [Muijoeng-je dou]$_i$ *mou-bingo* t_i soeng sik. ($\forall$>Neg-whQ, *Neg-whQ>$\forall$)
every-thing all no-who want eat
a. 'For each thing x, nobody wants to eat x'
(Lit. Nobody wants to eat anything at all.')
b. 'For each thing x, there is only a few people who want to eat x.'

The scrambled form in (227) allows the $\forall_{obj}$ to take wide scope, giving rise to the distributive reading, and also the existential 'only a few' reading of the Neg-whQ_{subj}. The change in interpretation when (226) scrambles to (227) is due not only to the scope taking, but also to the availability of the existential 'only a few' reading of the Neg-whQ_{subj} resulting from scrambling, and it is unique to constructions with Neg-whQs only. L2 learners need to treat Neg-whQs distinctively from NegQ in doubly quantified constructions, as well as realize that the scrambled $\forall_{obj}$ Neg-whQ_{subj} V constructions are not a free form of the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V constructions. Since doubly quantified constructions with NegQs include all possible readings of those with Neg-whQs in the non-scrambled and scrambled form, except the additional existential 'only a few' reading made available where Neg-whQ_{subj} is preceded by $\forall_{obj}$ in the scrambled $\forall_{obj}$ Neg-whQ_{subj} V structure, the existential 'only a few' reading is not acquirable without negative evidence or full access to the UG. Thus the learners' preference of particular readings, depending on which position Neg-whQs appear in, is predicted to be different from preference of Cantonese natives.

The learners' L1 grammar is predicted to have a negative transfer effects by virtue of learners transferring both collective and distributive readings in doubly quantified constructions. The L1 configuration contrasts with L2 Cantonese because scope taking of the quantifiers obeys the word order in overt syntax: subject-wide scope in non-scrambled sentences and object-wide scope in scrambled sentences. Even though both Neg-whQ>$\forall$ and $\forall$>Neg-whQ scopes are in principle possible in English, the collective reading where *nobody* takes scope over *every* is preferred on pragmatic grounds. The existential entailment in Neg-whQ>$\forall$ scope reading of the kind 'nobody eats all the sandwiches, but somebody eats at least one of them' is available in both English and Cantonese but is best represented in other structures (e.g. 'Somebody eats some sandwiches.'). L2 learners are predicted not to have any problem with Cantonese constructions like (226) where the Neg-whQ_{subj} precedes the $\forall_{obj}$. L2 learners are predicted to associate such constructions with collective readings as well as distributive readings like the native speakers do. However, scrambled forms as in (227) appear to be problematic to learners in L2 acquisition. There is neither scrambling in English grammar, nor any NegQ_{subj}-related existential reading available in $\forall$ >NegQ or NegQ>$\forall$ form. It is suggested in the literature that although interlanguages fossilize when the target language property represents a subset of an

L1's, there will also be successful L2 acquisition under the L2 POS conditions (White, 1989; Unsworth, 2005; Dekydtspotter *et al.,* 1999, 2001). In cases where the Neg-whQ$_{subj}$ occurs in a scrambled doubly quantified sentence and ambiguity arises, this phenomenon is more likely a superset rather than a subset of its L1 English counterpart. In the same way that Song and Schwartz argue that their L2 Korean interpretation phenomenon presents "a severe learnability problem" (2009, pp.330 – 331), I argue that acquisition of the existential 'only a few' interpretation of Cantonese Neg-whQs in the scrambled form is also a severe learnability problem of English-speaking learners of Cantonese.

The study argues that L2 acquisition of Neg-whQs$_{obj}$ poses learning difficulty to English-speaking learners and full acquisition of Neg-whQs in terms of its complex morphology and inherited features is the bottleneck. To summarise, it is difficult for learners to retrieve the possible existential interpretation of Neg-whQs, acquiring full interpretations and reading changes of a doubly quantified construction at syntax-semantics interface poses great challenge to learners. The lack of one-to-one morphological mapping and [Quant:_] feature of Neg-whQs in the interlangauge and the severe learnability problem of the existential interpretation associated with the scrambled form are likely to lead to deficiency or a delay in late L2 acquisition.

4.3. THE BOTTLENECK HYPOTHESIS (SLABAKOVA, 2006, 2008, 2010)

The aim of the current study is to test the Bottleneck Hypothesis, which suggests, "functional morphology is the bottleneck, syntax and semantics flow smoothly" (Slabakova, 2008, p.100). Slabakova suggests that syntax and semantics alone are innately given, so they are straightforwardly acquired. However, functional morphology is difficult to acquire because it is not usually represented overtly by the same lexical category in both L1 and L2. An example of a mismatch is aspectual marking in English and Chinese. The linguistic forms that encode the meaning of past events in English are inflectional morphology forms such as *–ed* which attach to every regular verb in English, whereas this is not necessarily and overtly marked in Chinese grammar. This is a challenge in L2 acquisition because this requires learners to learn a piece of morphology that is absent (e.g. in Chinese English interlanguage) or de-learn one that has a different meaning in the native language (e.g. in English Chinese interlanguage). Since meaning very much depends on the functional morphology, the challenge arises at the syntax-semantics interface where there is a form and meaning mismatch between native and target languages. Slabakova's proposal is based on the Minimalist Program, which predicts that movements driven by uninterpretable features are more difficult than those driven by interpretable ones. This is because formal uninterpretable features that have very little if any semantic content at all have to be deleted before Spell-Out. Examples of interpretable features are the English plural inflection on regular nouns (e.g. student-*s*) which implies that the inflected noun can only refer to more than one object. Interpretable features survive into the conceptual-intentional (CI) system since they contribute to meaning, making this feature interpretable and therefore undeletable. Uninterpretable features, per contra, include inflection on verbs which mark agreement (e.g. *are,* eat-*s*) and can only be interpreted when in relationship to a subject. Uninterpretable features survive until the articulatory-perceptual system can be pronounced but eliminated by the conceptual-intentional system.

Slabakova (2008) includes ten studies from Simple Syntax-Complex Semantics, involving the interpretive dependencies of binding, the aspectual challenges, article interpretation and the subjunctive mood. These studies were included to show that mapping semantics to new morphology and other grammatical morphemes slows down acquisition. Simple Syntax-Complex Semantics refers to learning situations where learners are very accurate in L2 syntax alone but have some difficulty at the syntax-semantics interface. The challenge is due to L2 learners problem in mapping forms with their corresponding meaning in the target language.

In addition, ten studies from Complex Syntax-Simple Semantics were also included, involving quantification, scrambling and *wh*-movement. These studies were also reviewed to show that syntax is not difficult, indeed that "in no case is syntax an impenetrable barrier to full achievement" (p. 260). Complex Syntax-Simple Semantics refers to learning situations observing the learners' POS, and where even native speakers show a lower acceptance than L2 learners of less frequent constructions (e.g. double genitives, discontinuous constituents, quantifiers at a distance, scrambling, etc.) than the learners. However, these properties do not lead to difficulty at the syntax-semantics interface because there are no mismatches.

Interpretation follows smoothly when the relevant functional lexical item has been acquired and the correct sentence representation has been constructed by L2 learners. In sum, difficulties occur where there is a mismatch between form and meaning and as a result a bottleneck for comprehension. The acquisition of inflectional morphology is necessary and sufficient for the acquisition of meaning.

Following Slabakova's (2008) theory, the Neg-whQ movement that is initially driven by an uninterpretable [*u*Quant] in vP is likely to cause difficult to L2 Cantonese learners. Therefore whether or not learners successfully master the SOV structure associated to obligatory movement of the Neg-whQ. In addition, the complex morphology of Neg-whQs correlates to the possibility to acquire the full meanings of Neg-whQs. The complex morphology of Neg-whQs {mou {Ø, bingo}} will be a challenge for L1 English learners of Cantonese to comprehend the existential 'only a few' reading since their closest L1 cognate to a Neg-whQ, *nowhere,* has no relationship to an existential reading.

Given that the difference between English and Cantonese Neg-whQs lies in the additional [Quant:_] feature in Cantonese, the second research question relates to whether or not this feature can be successfully selected in English-Cantonese interlanguage. Neg-whQ phenomenon, which represents a case of Simple Syntax-Complex Semantics, is predicted to be the bottleneck at the syntax-semantics interface. A delay in full acquisition of Neg-whQs is expected as it involves mapping the raised Neg-whQ$_{obj}$ structure, namely an SOV structure with or without SPs, with the corresponding readings, a negative reading with SPs with [-p] or lowering tone versus an existential reading with SPs with [+p] or rhetorical rising tone. In addition, learning difficulty is likely to arise from the change of interpretation of a Neg-whQ$_{subj}$ (e.g. S>O versus O>S) in the non-scrambled and scrambled form of a doubly quantified construction.

4.4. L2 STUDIES ON *WH*-PHRASES

This section discusses studies by Yuan (2009, 2010) and Dekydtspotter *et al.* (2001), and provides evidence for ultimate attainment on L2 acquisition of *wh*-elements. The type of test used in these studies is considered in the present study.

4.4.1 YUAN (2008, 2010)

Yuan investigated Chinese indefinite *wh*-words and tested the variable-dependent vulnerability of the syntax-semantics interface in L2 acquisitions. Yuan's study specifically looked at the L2 acquisition of Chinese *wh*-words licensed as existential polarity items (defined as EPWs in Chapter 2).

228. Wo bu xiang mai shenme. (Yuan, 2010, p.220 (1c))
I not want buy what
'I don't want to buy anything.'

Yuan's study looked at the syntax-semantics interface by investigating the licensing relationship between *wh*-words and the potential licensers such as negators and yes-no particles. Results show that adult L1 English speakers display deficits in fully acquiring the licensor-licensee relationships at syntax-semantics interface in L2 Chinese. Yuan suggested the L1-Dependent Interface Hypothesis, that whether L2 acquisition at the interface is successful depends very much on the availability of a similar interface in the L2 learners' L1 grammar. Although many studies stated that there is a possible delay and even incompleteness in L2 acquisition regarding the interface between the syntax and other domains (Hopp, 2004; Sorace, 2004; 2006; Tsimpli and Sorace, 2006), many others still claim that native-like grammars are attainable (Dekydtspotter *et al.*, 1999/2000; Dekydtspotter and Sprouse, 2001; Borgonovo *et al.,* 2005; 2006). By comparing Japanese and English speaking learners of Chinese, Yuan (2008, 2010) found a long delay in the licensing of Chinese *wh*-words as EPWs.

229. *L1-dependent Interface Hypothesis:*

...grammatical aspects involving an interface between syntax and other cognitive domains are acquirable in adult L2 grammars if such an interface is established in some forms in learners' L1; however, L2 items which are not available in learners' L1 will not be able to establish an interface relationship with another element in adult L2 grammars although they can fulfill their syntactic and semantic functions in a non-interface domain.

(Yuan, 2008, p.283)

According to Yuan, Chinese EPWs are licensed syntactically and semantically. Syntactically, EPWs must appear in the c-command scope of its licenser, namely the negators, *bu* 'not' in between repeated verbs (defined as A-not-A) and the yes-no particle, *ma*. Semantically, EPWs need be in a context where the proposition containing EPW is a non-fact or where the truth-value of the proposition is not necessarily positive in a definite manner. Such licensing conditions include the conditional words *ruguo* 'if', adverbs assuming a proposition to be true or those presupposing the following statement to be false and SP *le*. Apart from this, Chinese EPWs are only licensed in object positions. Japanese *wh*-words can be licensed as EPWs by combining them with the particle (some-) '*-ka'* or (any-) '*-mo'* whereas English wh-words are not EPWs because they carry the embedded features [+Q] and [+wh].

The main research question in Yuan (2010) investigated whether the licensing relationship between the EPW and its licensers is acquired across the syntax-semantics interface, or depends on individual variables such as variation in the licensing power of different licenser types cross-linguistically. An acceptability judgment test was completed by 107 English and 111 Japanese L2 learners of Chinese as well as 20 Chinese native speakers. The L2 learners were subdivided into beginner, post-beginner, intermediate, post-intermediate and advanced levels using a cloze test. Yuan's study (2008, 2010) argued against domain-wide vulnerability at the syntax-semantics interface. Since English *wh*-words cannot be used as EPWs, while Japanese *wh*-words can, the advanced English learners are expected to have a problem in accepting Chinese *wh*-words as EPWs, whilst the Japanese learners are not, that is a domain-wide vulnerability. However, both learner groups found EPWs in their licensing domain grammatical except some of the licensers that do appear in any form in their L1s. The results in general indicated learners' acceptability of negators, non-factive verbs, adverbs, and *ruguo* 'if' as licensers for EPWs. Mean acceptability gradually increased with proficiency. Except for non-factive verbs and *ruguo* 'if', these licensers were acquired as licensers for EPWs earlier by L1 Japanese than the L1 English groups. All participants in the advanced groups had acquired the licenser-licensee relationship between EPW and the four variables.

When analysing the individual variables tested in his study, Yuan came to the following conclusions. The licenser-licensee relationship was not established between EPWs and the two variables, the inferential *–le* and *A-not-A* in the Japanese-Chinese and English-Chinese interlanguages. Regarding the yes-no particle *ma*, the advanced L1 Japanese speakers accepted it as an appropriate EPW licenser, while all the English L1 speakers failed to acquire it as a possible EPW licenser. Similar to the Chinese natives, the yes-no particle *ma* had moderate licensing power for the advanced L1 Japanese participants, whereas it had no licensing power to the advanced L1 English participants. While the inferential *–le* had moderate licensing power and *A-not-A* had weak licensing power in the natives' Chinese grammar, there is a lack of licensing power of these two licensing variables in learners' Chinese grammars. Overall the results suggested that difficulties in the L2 acquisition at the syntax-semantics interface are not domain-wide but dependent on licensers lacking 'wiring' with EPWs in learners' underlying representation of L2 Chinese grammar due to L1 transfer influence. EPW licensers can be categorized into lexical-word (e.g. negators, non-factive verbs, uncertain adverbs, 'If'-word) and functional-morpheme licensers (e.g yes-no particle *ma*, inferential *–le*: head of ForceP, and *A-not-A* carrying a [+Q] feature). The latter category is hypothesized as leading to higher indeterminancy and a longer delay in L2 acquisition.

Yuan argued that L2 acquisition of grammatical items involving an interface will not be successful unless the same interface is established in the L2 learners' L1 grammar, even if L2 learners at the advanced proficiency level show knowledge of the individual syntactic and semantic properties in a non-interface domain. Learning difficulty of L2 Chinese EPWs is expected not solely because there is a lack of *wh*-words being used as existential polarity items (e.g. English), but because there is a lack of the underlying representation of particular functional licensers in learners' L1s that makes L2 acquisition of it at the semantics-syntax interface difficult even at the end state of L2 grammars. Yuan's study sheds light in setting out the reasons for the potential long delay or deficit in full acquisition of Neg-whQs in L2 Cantonese, in particular the additional existential 'only a few' reading. This may be due to a lack of 'wiring' between Neg-whQs and functional-morpheme licensers like SP with a [+p] feature which push the additional existential reading in English, the L1 of participants to the current study. Hence, the alternation in taking scope in doubly quantified constructions, which is due to the availability of the existential reading of the Neg-whQ$_{subj}$ after scrambling, is likely to lead to non-native-like performance by L1 English speakers. However, the equivalent negators as lexical-word licensers in English grammar supply the licensing relationship between negators and NPI, as well as the internal morphology of a Neg-whQ (*nowhere*). Consequently, the L2 acquisition of the negative reading of Neg-whQs in L2 Cantonese is highly probable.

4.4.2. DEKYDTSPOTTER, LAURENT, REX A. SPROUSE, AND KIMBERLY A. B. SWANSON (2001)

Dekydtspotter *et al.* (2001) examined the L2 acquisition of the interpretation of the discontinuous *Combien* interrogatives, a property at the syntax-semantics interface in L2 French by adult learners with L1 English. Dekydtspotter *et al.*'s study aimed to explain the mental architecture governing the L2 knowledge by comparing it to the principles that constrain L1 acquisition. Assuming the following given context:

230. John is buying *The Great Gatsby, The old Man and the Sea,* and *Finnigan's Wake.* Mary is buying *The Great Gatsby, The Old Man and the Sea,* and *Ulysses.*

Examples of the two question structures are raised according to the given context above in (230) (Dekydtspotter *et al.,* 2001, p.177), and they are presented in (231 – 232).

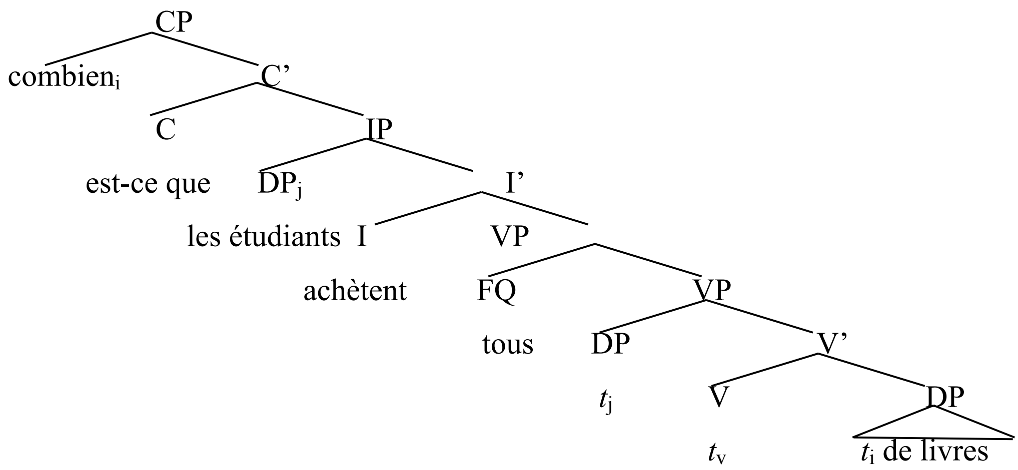
231. Combien de livres est-ce que les étudiants achètent tous?
how many of books is it that the students buy all
'How many books are the students all buying?'

232. Combien est-ce que les étudiants achètent tous de livres?
how many is it that the students buy all the books
'How many books are the students all buying?'

The continuous *combien* question in (231) is ambiguous in interpretation: it either interrogates the amount of books that the students buy in common or the amount of books that any student buys. Therefore the answers to question (231) can either be 'two', where both John and Mary buy *The Great Gatsby* and *The old Man and the Sea* or all three books, or 'three', where John and Mary each buy three books. In comparison, the discontinuous *combien* question in (232) allows only for the interpretation that interrogates the amount of books that any student can buy and therefore the only possible answer is 'three'.

The different possible interpretation can also be explained by a syntactic constraint on the discontinuous *combien* interrogative. Since [*combien…de livres*] is split and *de livres* is left in-situ, *de livres* can only take on scope under the universally quantified subject NP. This is explained in the following representation.

233. (Dekydtspotter *et al.,* 2001, p.179)



The *combien* extraction satisfies the Empty Category Principle as the trace is properly licensed in a head-governed position within DP. Thus, the object *de livres* can only take on narrow scope in relation to the subject. That is why the continuous *combien* can take up ambiguous answers, as *combien de livres* can take on a narrow scope in the base generation as well as wide scope at Spell-Out. Since the discontinuous *combien* interrogatives map to all interpretations that the continuous *combien* interrogatives also do, except 'one', the true answer to the former type in a given context can also be true in the latter type, but not vice versa. There is no evidence in the input to prove that discontinuous *combien* is not a rewritten variant of continuous *combien* interrogatives. L2 learners may incorrectly overgeneralise discontinuous reading to ambiguous ones by matching continuous *combien* questions. The discontinuous *combien* interrogatives lead to learnability problems because they are neither taught nor even presented in a classroom situation, and the evidence for correct answers is lacking in the input. The asymmetry in answers to the continuous *combien* and discontinuous *combien* interrogatives bring forth the learnability problem in L2 acquisition.

Dekydtspotter *et al.* (2001) used a truth value judgment task to test whether learners can differentiate between continuous and discontinuous *combien* interrogatives in their scope possibilities that is wide scope versus narrow scope of the interrogated object phrase as two different structure types, rather than the discontinuous *combien* interrogatives being a simple permutation variant of the continuous ones.

The results indicated that the French native speakers tended to accept narrow scope to a statistically significant higher degree than wide scope in both contexts. There was no statistically significant difference in natives' acceptance to narrow scope as the correct response to continuous and discontinuous *combien* interrogatives, since narrow scope answer is the correct answer to the interpretation of both question types. Regarding wide scope answers, the natives showed a statistical difference in accepting wide scope for continuous *combien* to a higher extent than discontinuous *combien*. As for the L2 learners, the advanced group showed the lowest acceptance of wide scope answers to discontinuous *combien* interrogatives and around 50% acceptance for continuous *combien*. A significant difference in the advanced L2 learners' acceptance of wide scope answer for continuous versus discontinuous *combien* questions was found. The advanced group performed more like the French native group, as the two groups had a significantly higher acceptance rate for narrow rather than wide scope for discontinuous *combien* questions. In contrast, the intermediate learners showed a statistically significant higher preference for continuous rather than discontinuous *combien* questions regardless of their acceptance of narrow versus wide scope answers. There is a significant difference between the L2 intermediate, L2 advanced, and native groups for acceptance of wide scope and narrow scope answers between continuous and discontinuous *combien* questions insofar as the intermediate learners' performance was more like the performance of English natives. More specifically, both the intermediate and native groups accepted answers in continuous *combien* structures more frequently than the discontinuous ones. Finally, no significant difference in the acceptance of narrow versus wide scope answers to discontinuous or continuous interrogatives was found.

Dekydtspotter *et al.* concluded that representations at the syntax-semantics interface are governed by UG which accounts for the differentiation between continuous and discontinuous *combien* in the native speaker group. UG was, nonetheless, available in L2 acquisition of French, since L2 French-like knowledge of scope in combine interrogative contexts cannot be the outcome of either L1 transfer or learning from the input. During L2 acquisition, there was interaction of L1-like and L2-like knowledge in English-French interlanguage. This study suggests that L2 acquisition is constrained by UG principles in the same way as L1 acquisition, and the claim that there is a strong effect of L1 in L2 acquisition is supported.

In the same fashion as Dekydtspotter *et al.*'s study, in the current study scope properties as instantiated in the L1 grammar are hypothesized have an effect in L2 acquisition when constructions involving a Cantonese *wh*-element and a universally quantified NP are involved. The current study predicts a strong effect of L1 English in L2 acquisition of Cantonese doubly quantified constructions involving a Neg-whQ$_{subj}$ (as a *wh*-quantifier) and a $\forall_{obj}$. L1-like performance in allowing both subject-wide (Neg-whQ>$\forall$ leading to a collective reading) and object-wide ($\forall$>Neg-whQ leading to a distributive reading) scope readings is expected regardless of scrambling in English-Cantonese interlanguage. However, the availability of the existential reading in the scrambled form may cause learning difficulty to learners because it is limited to the embedded interpretation of subject-wide scope (Neg-whQ>$\forall$). L2 learners in the current study have to differentiate the scrambled construction from the non-scrambled one and not simply treat the former as a rewritten variant of the latter one. If participants to the present study follow the patterns obtained from Dekydtspotter *et al.* (2001), English-speaking learners of Cantonese achieving advanced levels of proficiency should: i) be able to overcome the learning problem regardless of scrambled forms being taught in classroom; ii) acquire the existential reading of scrambled constructions despite evidence from the input.

4.4.3. IMPLICATIONS FOR THE PRESENT STUDY

Yuan's (2010) study provides evidence for ultimate attainment of Chinese indefinite *wh*-words licensed as existential polarity items in L2 acquisition. It also argues against domain-wide vulnerability at the syntax-semantics interface, supporting a variable-dependent approach. Yuan not only suggests which aspects of L2 acquisition are expected to be difficult, but also sheds light on factors that potentially hinder L2 acquisition in terms of the relationship between EPWs and their licensers. Yuan (2010) echoes Slabakova (2006, 2008, 2010) in that functional morphology is particularly difficult for L2 learners due to the lack of one-to-one matching between L1 and L2 (as discussed previously). In consequence, we also predict a long delay in fully acquiring knowledge of Neg-whQs in English-Cantonese interlanguage for two reasons. First, there is a lack of one-to-one matching of the internal morphology of Neg-whQs between L1 English and L2 Cantonese. Second, there is a lack of 'wiring' of Neg-whQs and functional-morpheme licensers such as the SP with [+p] feature which pushes the additional existential reading.

Dekydtspotter *et al.* (2001), on the other hand, provides strong evidence to the claim that L2 acquisition at the syntax-semantics interface is attainable even with the POS problem, and that L2 acquisition is constrained by UG in the same way like L1 acquisition. The *combien* extraction cannot be acquirable, if UG does not constrain in English-French interlanguage. Dekydtspotter *et al.*'s study explains very well the development of L2 *combien* structures, from being English-like to French-like as L2 proficiency levels increase. Since the statistical significant difference between groups was not found, advanced learners were suggested to be able to approach French native-like competency. In a similar way, the current study investigates whether advanced L2 Cantonese speakers with L1 English differ from native Cantonese speakers in the correct interpretation of a Neg-whQ$_{subj}$ in scrambled doubly quantified constructions that are subject to a POS problem. In addition, it looks at differences between advanced L2 speakers and native speakers in terms of their ability to select the correct interpretation for a Neg-whQ$_{subj}$ in constructions where the Neg-whQ$_{subj}$ is scrambled and where it is not.

Some considerations with respect to the type of test used by Dekydtspotter *et al.* are in order. It is interesting to note that written English language scenarios in a truth value judgment task were used in Dekydtspotter *et al.*'s study. Although it might require a lot of translation work in experiment design, it also appear to be the most straightforward and clear way to present such abstract interpretation regarding *combien* extraction at the syntax-semantics interface in French interrogatives. The fact that the results did not yield unexpected or anomalous patterns suggests that it was able to successfully avoid misunderstanding, and making a wrong interpretation. As the present study also looks at ambiguous interpretations, albeit of L2 Cantonese Neg-whQs, written contexts are also a viable methodology to test difference in choice of the abstract existential 'only a few' reading and negative reading of Neg-whQs.

4.5. L2 STUDIES ON QUANTIFIERS' SCOPE TAKING

This section discusses studies related to doubly quantified constructions by Marsden (2004, 2008, 2009) and Lee (2009). The former clearly sheds light on the POS problem and the latter brings insights to the investigation of the interaction of a universal quantified NP and negation. Methodology of these studies is taken into consideration.

4.5.1. MARSDEN (2004, 2008, 2009) QP–QP/*WH*–QP INTERACTION

Marsden's study (2008, 2009) discussed the L2 acquisition of two L2 POS phenomena in L2 Japanese quantifier scope interpretation. Both phenomena involve constraints at the syntax-semantics interface were investigated (Marsden, 2004). Following Schwartz and Sprouse's (2000) framework, the ability in attaining native-like knowledge by Chinese, English and Korean speakers was investigated. The two L2 POS phenomena include: i) the lack of pair-list reading in *wh*–object/QP–subject questions; ii) the contrast between the unambiguity of non-scrambled doubly quantified constructions and the ambiguity of scrambled constructions. The knowledge involved in these POS phenomena was reported as underdetermined in some learners' L1s and could not be derived from L2 Japanese input typically provided in classroom settings. It is a POS problem for English-speaking learners on the QP–QP sentences and for both English and Chinese-speaking learners on *wh*–object/QP–subject questions. Example (234) represents the lack of pair-list reading in *wh*–object/QP–subject questions in Japanese.

234. a. Nani-o daremo-ga kata no? (Marsden, 2004, p.11 (7))
what-ACC everyone-NOM bought Q
'What did everyone buy?'

Example answer to (234a):
b. 'A book.' (individual answer)
c. *'Bill bought a book, Sally bought a pen, Jane bought a bag, …'
(Pair-list answer)

Previous studies claim that a pair-list reading is unavailable in Korean and Japanese (Hoji, 1985; Yoshida, 1995; Saito, 1999) while both pair-list and individual readings are available in Chinese and English *Wh*–object/QP–subject questions. However, the results showed that Korean natives tended to accept pair-list answers as well despite the absence of a pair-list reading in L1 Korean. Hypotheses were formulated according to Schwartz and Sprouse's (1994, 1996) FT/FA, stipulating that English/Korean-speaking learners with lower proficiency would incorrectly accept both individual and pair-list answers in L2 Japanese whereas Chinese-speaking learners with lower proficiency would incorrectly accept pair-list answers and reject individual answers.

The relationship of ambiguity and scrambling in declarative forms in Japanese is as follows:

235. a. Japanese: Dareka-ga dono hon-mo yonda. (Marsden, 2009, p.137)

Korean:	Nwukunka-ka	enu chayk-ina	ilkessta.
	someone-Nom	every book	read

'Someone read every book.'

Interpretation:

S>O: There is some person x, such that x read every book.

b.

Japanese:	Dono hon-mo	dareka-ga	yonda.
Korean:	Enu chayk-ina	nwukwunka-ka	ilkessta.
	every book	someone-Nom	read

'Someone read every book. (scrambled)'

Interpretation:

S>O: There is some person x, such that x read every book.

O>S: For each book y, some person read y.

The canonical form in (235a) in both Japanese and Korean gives rise to only subject wide scope whereas the scrambled form in (235b) leads to ambiguity of both subject wide and object wide scopes. The study originally undertaken in 2008, looked into the properties related to Korean *nwukwuna and* Japanese *daremo* universal quantifiers 'everyone'. Both quantifiers are formed by a *wh*-word and a particle, which according to Saito (1999) belong to the same quantifier class. With QP–QP sentences, only subject wide scope is allowed in SOV order while both subject wide and object wide scopes are available when the sentences are scrambled into OSV order in both Japanese and Korean (Marsden, 2009 in particular). On the other hand, English allows both scope readings and has no scrambling. English-speaking learners of Japanese were hypothesized to incorrectly allow object-wide scope (O>S) whereas Korean-speaking learners of Japanese were expected to reject it in SOV orders due to L1 transfer. Both L1 groups at higher proficiency levels were expected to reject O>S scope on a par with natives. A paced acceptability judgment task with pictures depicting both individual and pair-list interpretations for Japanese *wh*–object/QP–subject questions, and pictures depicting both subject-wide (S>O) and

O>S scope interpretations for Japanese QP–QP sentences, were used in all Marsden's studies (2004, 2008, 2009).

In general, Marsden's results affirm that although intermediate learners' interlanguage grammar diverges from the natives' grammar because of L1–L2 divergence with respect to the phenomenon investigated, advanced learners can overcome the POS problem and acquire target-like knowledge after restructuring their interlanguage grammar. Marsden's (2004) study of Japanese *wh*–object/QP–subject questions provided a strong argument for L1 transfer effects in L2 acquisition. Results from the L1 groups displayed the pattern predicted, that intermediate English and Korean-speaking learners would equally accept both interpretations while intermediate Chinese-speaking learners would accept the pair-list reading more readily than the individual reading. In general, all learners had not acquired the fact that pair-list answers were unavailable in Japanese *wh*–object/QP–subject questions. Marsden's (2008) study provided stronger evidence in hypothesizing the L1 effect by comparing Japanese *daremo* with Korean *nwukwuna*, Chinese *meigeren* and English *everyone*. The L2 results showed that all intermediate groups did not differentiate between individual and pair-list answers in a target-like way and all advanced groups show higher acceptance of individual than pair-list answers. All advanced learners accepted pair-list answers to a higher rate than the Japanese native group. The results from Marsden's study (2009) support full transfer because the L1 Korean learners' and Japanese natives' acceptance rates on O>S scope with SOV sentences were significantly different from the intermediate L1 English learners with SOV sentences. In addition, all groups showed higher acceptance rates on O>S scope in scrambled OSV order, as predicted.

L2 acquisition at the interface being constrained by UG is supported by the results of individuals' undertaking the *Wh*–QP interpretation task (Marsden 2004, 2008). Some advanced learners in these study demonstrated consistent rejection of pair-list answers as well as consistent acceptance of individual answers. In a QP–QP task in Marsden (2009), the advanced groups were more likely to accept O>S scope in scrambled OSV than in canonical SOV order, showing a similar acceptance rate pattern to the Japanese natives'. The result for individual answers indicated that half of the advanced English-speaking learners consistently rejected O>S scope in canonical sentences. In general, the individual results from all Marsden's studies confirm the claim that some L2 learners have full access to UG during their interlanguage restructuring (Schwartz and Sprouse, 1994, 1996). Following Marsden's studies, some individual English-learners of Cantonese are also predicted to be able to differentiate scrambled doubly quantified constructions from non-scrambled ones once L2 learners reach advanced proficiency.

4.5.2. LEE (2009) *NOT*–QP INTERACTION

Lee (2009) reports some rare adult data on negation and universal quantified NP interactions (*Not*–QP) in Korean-English interlanguage, that offers insight on the type of methodology to be possibly used for the current investigation of a Neg-whQ and universal quantified NP interactions (Neg-whQ–QP) in English-Cantonese interlanguage. This study investigated English constructions where a universal direct object quantified NP is preceded by the negative particle *not* as in (236):

236. Cindy didn't light every candle last night. (Lee, 2009, p.7 (2))
→ $\neg\forall$x [candle (x) à Cindy lit (x)] (Lit. 'Cindy lit only some candles.')

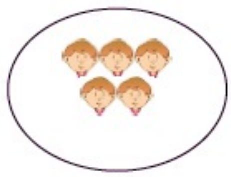
Musolino *et al.* (2000) supports that ambiguity disappears in constructions where *not* takes scope over *every* (not vice versa), and the interpretation in (236) is referred to as a partitioned set interpretation where *not* has scope over *every* giving an interpretation that can be paraphrased as 'Cindy lit only some candles'. On the other hand, ambiguity occurs when the universal quantified NP is in the subject position, and both full set interpretation and partitioned set interpretation are available. The full set interpretation refers to the interpretation where *every* has scope over *not* and it can be paraphrases as 'All the candles were not lit.' The study is based on ambiguity observed in Korean with long negation in *Not*>*every* sentences in an SOV structure.

Lee (2009) included O'Grady *et al.*'s (2008) efficiency-based processing approach investigating the same area in explaining the data. It is suggested that scope taking determined by the surface order minimizes the burden on working memory in terms of language processing. In processing a sentence where the universal quantified subject precedes the negative operator, which is the invariable case in Korean with its SOV word order, the full set interpretation is easier because the partitioned set interpretation creates an extra burden on working memory. A prediction is formulated for L1 Korean learners of English behavior in the early stages of acquisition when L2 learners are transferring their L1 knowledge which induces them to prefer the full set interpretation, no matter what. An example illustrating the two steps in processing *Not*–QP constructions (Lee, 2009, p.26 (24)) is provided as follows:

237. Partitioned set interpretation (subject-*motun* pattern in Korean)

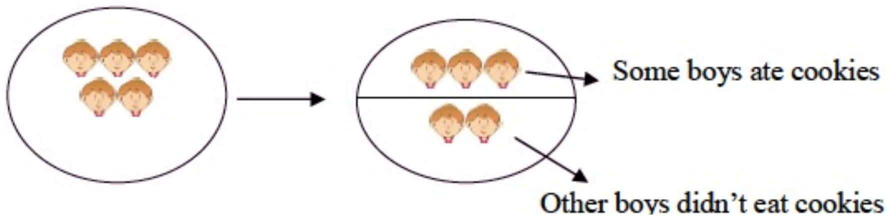
First step

motun sonyen-i
every boy



Later step

motun sonyen-i kwukhi-lul mek-ci anh-ass-ta
every boy -NOM cookie-ACC eat-CI NEG do-PST-DECL



A self-paced reading and truth-value judgement task were chosen for an off-line study to test learners' ability to disambiguate test sentences of *Not*–QP interactions. A test stimuli is in (238):

238. Tom didn't solve every puzzle in the classroom.
a. Tom solved only some of the puzzles in the classroom.
b. Tom solved none of the puzzles in the classroom.

The task design, which follows Conroy's (2008) techniques of asking participants evaluate the two interpretations in parallel, is claimed to elicit a genuine preferred reading. Results provide evidence for the correlation of L2 scope interpretation and L1 processing cost. As predicted, Korean learners of English at lower proficiency levels showed a strong preference for full set interpretations in sentences with negation and universal quantified object interaction. L2 learners at higher proficiency level responded more readily to the partitioned set interpretation. However, a strong preference towards partitioned set interpretation and not the full set interpretation was not found in English natives' results. This study reports limitations that sentence comprehension research paradigms have. Since interpretation takes place as soon as each word is encountered from the input, a self-paced reading format could create processing difficulty in constructions with negated verb. The reported limitations are taking into account and a reading forma in investigating abstract interpretations of the interaction of negations and a universal quantified NP is avoided in the present study of Cantonese Neg-whQs.

4.5.3. IMPLICATIONS FOR THIE PRESENT STUDY

Marsden (2004, 2008, 2009) clearly sheds light on the POS problem. It is useful to note that Marsden looked at L2 learners' individual consistency in native-like performance, and this yielded evidence of UG constraints in the L2 development. Although the results showed the unexpected fact that intermediate L1 Korean learners almost equally accepted both readings in *Wh*–QP questions, contrary to hypothesis, a focus-based account was provided to further explain the unexpected results encountered in the control groups. Marsden (2008) suggested that stress on the object phrase turns old information into new information/focus and increases the possibility of individual readings. The omission of Korean *–ka* (being optional) could give rise to pair-list readings, although the correlation of stress giving rise to individual readings, and without stress giving rise to pair-list readings, is not very clearly explained. However, the importance of acquiring the focus property of post-nominal grammatical particles, is clearly pointed out. This sheds light on the necessity of revising the recordings with sentences ending with sentence particles (in specific tones) in the main experimental work of this study. The importance of looking at lexical features as well as the effect of L1 transfer to explain the fossilization problem in L2 acquisition (even at advanced stage of interlanguage) was suggested in Marsden's (2008) study, therefore a feature-based approach in explaining L2 acquisition of Neg-whQs in Cantonese has subsequently been adopted.

Lee (2009) is one of the few quantitative empirical studies investigating the area of scope interpretation and the interaction of a universal quantified NP and negation. The processing approach adopted helps hypothesize L2 learners' performance in doubly quantified constructions of the main study. In the current study, we take into account the difficulty in testing negated contexts. To avoid processing cost suggested in Lee's (2009) study, the aspect of the design requiring both interpretations be evaluated in parallel has its merits and will be taken into account in the methodology of this study.

Another aspect of the methodology adopted by this study is the acceptability judgement task (AJT). The AJT contextualised the test items by use of pictures which avoids placing extra burden on the L2 learners who are already trying to contextualize sentences by means of text. This type of test also saves time in terms of translating work.

4.6. CONCLUSION

This chapter presented a series of studies suggesting a learning difficulty at the L2 interface between syntax and semantics. On this basis it proposed approaches to be adopted in the current study, it reviewed the methodology for testing abstract knowledge of scope interpretation in doubly quantified constructions, and looked precisely at L2 studies of indefinite quantifiers involving *wh*-elements.

In this study, learning difficulties relating to Neg-whQs were postulated in order to test Slabakova's Bottleneck Hypothesis. Slabakova (2006, 2008, 2010) investigated the L2 acquisition of properties at the interface of syntax and other cognitive domains (e.g. semantics and pragmatics) by taking into account the role of meaning in the realization of morphology. It was shown that L2 acquisition is not purely dependent on L2 learners' success in acquiring forms at syntactic and semantic level, but also with regard to meanings that relate to particular L2 syntactic structures at the interface. When there is no one-to-one mapping, for example, either of the linking pronouns with their antecedents or the licensing relationship between the EPWs and their licensors, from L1 grammar to L2 grammar, indeterminacy is assumed, even for L2 learners at the end state of their interlanguage grammar. It was suggested that successful L2 acquisition is very much dependent on what is available at the interface from the L2 learners' L1 grammar. Given that the difference between

Cantonese and English Neg-whQ lies in its feature(s) inherited from its internal morphology, the current study aims to test the L2 acquisition of Cantonese Neg-whQs at the syntax-semantics interface in order gauge the difficulties that occur when no one-to-one mapping between the internal morphology of English *nowhere* and Cantonese Neg-whQs.

To test the hypothesis, this study investigates whether L2 acquisition of Cantonese Neg-whQs, a type of *wh*-quantifier, presents any difficulty to adult near-native learners. Neg-whQ is morphologically composed of a negative morpheme and a *wh*-phrase. The functional morpheme, the negative morpheme *mou*, combines with *wh*-phrases in Cantonese, licensing the whole compound as a *wh*-quantifier and giving rise to dual interpretation: an implied existential 'only a few' and an absolute negative interpretation. This study predicts that full L2 acquisition of Cantonese Neg-whQs, and in particular the additional existential 'only a few' reading, is a challenge to L2 learners. The [Quant:_] feature, which triggers the existential reading, is predicted to slow down the L2 acquisition of overt movement and dual interpretation which is constrained by information at the morphology-syntax and syntax-semantics interfaces. In addition, the additional existential reading in sentences of the type *for every sandwich, there are only a few people who eat it* available in scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V structure of a doubly quantified construction represents a POS problem at the syntax-semantics interface. Neg-whQs are neither taught nor presented in any classroom input and there is no evidence for the change of interpretation by scrambling in the L2 input. Learning the existential reading made available by scrambling is hypothesized to pose a major difficulty to the L1 English speakers, because this knowledge is underdetermined in L1 English and L2 Cantonese input.

In light of the literature reviewed above, a GJT to test learners' response to the grammatical SOV structure of a Neg-whQ$_{obj}$ construction at the syntactic level, a CJT to test learners' acknowledgement of the additional existential reading at the semantic level, and a PJT to test learners' interpretation in doubly quantified constructions with or without scrambling at interface levels were used in the main study.

CHAPTER 5

METHODOLOGY AND PRELIMINARY STUDIES

5.1. INTRODUCTION

The aim of the experimental studies involved in this dissertation is to test FA of the claims of the FT/FA model of L2 acquisition (Schwartz and Sprouse, 1994, 1996) and investigate the Slabakova's Bottleneck Hypothesis that "functional morphology is the bottleneck, syntax and semantics flow smoothly" (2008, p.100). In other words, this dissertation predicts that adult English speakers will encounter difficulty in acquiring Cantonese Neg-whQs and that ultimate attainment could not be achieved. It aims to look at the possibility for adult advanced English speakers of Cantonese to achieve native-like competence of the colloquial outlined in Chapter 4. To achieve this goal, experiments were designed on the basis of the syntactic proposal in Chapter 3 targeting an L2 learners' knowledge at three levels: i) syntax by testing their acceptance of obligatory and overt movement of a Neg-whQ$_{obj}$ construction in SOV structures; ii) semantics by testing their response to possibly associating Neg-whQ$_{obj}$ constructions to existential readings; and iii) syntax-semantics by testing their responses to dual interpretation in doubly quantified constructions that involve scrambling. In order to test these three levels of grammar, a GTJ, a CJT and a PJT were used.

This chapter details the experimental design for this project. It is organized as follows. Section 5.2 provides details of participants, design and procedures of the GJT, CJT and PJT. Section 5.3 presents the findings of the preliminary studies. Section 5.4 details the relative amendments made for the main study. Section 5.5 summarises the findings of the preliminary study, highlights limitations of the design, and outlines the final materials and procedures as they will be implemented in the main study to be detailed in Chapter 6.

The three research questions are repeated as follows.

239. Can English-speaking learners of Cantonese acquire the syntax an semantics of a Neg-whQ_{obj} construction?

240. Does the absence of a [Quant:_] feature in the learners' L1 English play a role in their acquisition of the dual reading of Cantonese Neg-whQs?

241. Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?

5.2. METHOD OF THE PRELIMINARY STUDY

5.2.1. PARTICIPANTS

Two groups of speakers from Hong Kong participated in the pilot study. They included 16 native speakers of Cantonese (NS) and 10 adult English L2 learners were five beginners and five advanced learners recruited from a private Cantonese language teaching institute (Gaby's ChatRoom[9]). All the L2 learners attended a two-hour Cantonese class on a one-to-one basis once a week and their proficiency level was determined according to their years of instruction in the L2. L2 learners at the beginner level generally had less than a year's instruction, ranged in age from 31 to 51 and their years of living in Hong Kong ranged from one and a half years to 24 years. The advanced learners had studied Cantonese for more than two years and mastered daily conversation in Cantonese; their age ranged from 53 to 62 and their years of living in Hong Kong ranged from two to 29. The NSs were recruited from a pool of friends and ranged between 20 and 60 years of age. All the native participants were degree graduates except for two and spoke some English. Nine out of 16 spoke MC, one spoke Spanish, one spoke French and one spoke Chiu Chow dialect as their L2s. However, one native's result was eliminated because the participant failed all distractors in the CJT.

[9] Registration Certificate No. 50991043-000-08-13-6 dates 03/08/2013 to 02/08/2014.

5.2.2. MATERIALS AND PROCEDURES

The test was an individual self-paced test. Participants sat in front of a portable PC and were asked to press the ENTER key to proceed from one slide to the next on a PowerPoint presentation shown and were given answer sheets to fill in alongside. Before each task began, instructions were presented aurally as well as written in English on the answer sheets under each section. All sentences were presented visually on the computer screen using the Jyutping[10] system and an aural presentation was included to aid learners' understanding. Verbal instructions and written instructions on the answer sheet were given prior to each task of the pilot test. Instructions included information on what the participants should do with the displayed test item on the screen for each task. Each slide presents one test item. Participants were asked to move on to the next slide at their own pace. The audio files were automatically played along with each test item. Participants were allowed to repeat the audio presentation more than once if necessary. In GJT, sentences were presented one by one using PowerPoint slides. In CJT, a given context and its corresponding five options were presented on each slide. Participants were asked to again press the ENTER key to repeat the audio sound file for each option as many times as they liked, if necessarily. In PJT, a sentence and a picture were presented on each slide. The given contexts or pictures did not appear on the participants' answer sheets, but were presented in the PowerPoint presentation only.

Both native and learner groups were given the same PowerPoint presentation but used different sets of answer sheets. Their answer sheets only differed in terms of the information being asked for in the attached consent form. The total time taken for the whole test differed individually according to different participants but, on average, took approximately 30 minutes. The overall procedure of the main study was revised after this pilot study, and details will be included in Chapter 6 with the main study findings.

[10] Jyutping is a romanization system for Cantonese developed by the Linguistic Society of Hong Kong (LSHK) in 1993. It is currently used for the standardized phonetic transcriptions used in Cantonese learning nowadays. Learners at Gaby's Chatroom are familiar with this phonetic transcription system in learning Cantonese. http://www.lshk.org/node/31

5.2.2.1. GRAMMATICALITY JUDGEMENT TASK (GJT)

This task aimed to test L2 learners' underlying competence of features related to Neg-whQs in their interlanguage, that is the [Quant:_] feature which forces the projection of [*u*Quant] in light v and gives rise to the overt and obligatory raising of a Neg-whQ$_{obj}$. In other words, the GJT was designed to test their correct acceptance of the SOV word order with Neg-whQ$_{obj}$ constructions. Therefore, the key variable was word order: SOV versus SVO. Given that there is some restriction on moving elements outside a finite clause in English grammar, another variable, Finiteness, (Finite versus Non-finite) was also manipulated in the design. The aim of this task was to test the L2 acquisition of word order of Neg-whQ$_{obj}$ constructions with the underlying [Quant:_] (detailed in Chapter 3). In addition, the task was designed to test for any effect of finiteness.[11] The task included 24 tokens, involving 8 control items and 16 experimental items, half of which were grammatical and the other half ungrammatical. The control sentences include no Neg-whQs, but NegQs with grammatical SOV structure and referential NPs with grammatical SVO structure. The two variables are presented as follows:

242. Variable 1: Finiteness
    Finite verbs versus Nonfinite verbs

243. Variable 2: Word order (Grammaticality)
    - grammatical SOV order versus ungrammatical SVO order in Neg-whQ$_{obj}$/NegQ$_{obj}$ constructions
    - grammatical SVO order versus ungrammatical SOV order in normal object constructions

The 16 experimental items tested finiteness and word order.

[11] The effect of finiteness was originally designed to compare overt raising of a Neg-whQ$_{obj}$ out of a clause with finite verbs versus non-finite verbs in a bi-clausal sentences such as *Mary says no-who$_i$ John wants to meet t$_i$* versus **Mary says no-who$_i$ John met t$_i$*. However, the bi-clausal sentences were excluded after (pre-) piloting. This was due to the rejection of *Mary says no-who$_i$ John wants to meet t$_i$* types even among NSs and is believe to be a burden to processing. In order to minimize burden to participants taking part in quite a long test, bi-clausal types were excluded. Details can be found in Appendix 1 and 2.

Table 8 reports examples for each of the four types of experimental items.

Table 8: Experimental sentence types in the GJT

Type	Word Order	Finiteness	Examples	No. of items
Fin.G	Grammatical SOV	Finite verbs	David *mou-bingo* soenghoi-guo. David no-who hurt-ASP a.‘David hurt nobody.’ b. ‘David hurt only a few people.’	4
NonFin.G		Nonfinite verbs	James *mou-matje* zungji (wo). James no-what like (Q) a. ‘James likes nothing.’ b. ‘James likes only a few things.’	4
Fin.B	Ungrammatical SVO	Finite verbs	*Matthew sik-zo *mou-matje*. Matthew eat-ASP no-what	4
NonFin.B		Nonfinite verbs	*Andrea soeng gin *mou-bingo*. Andrea want meet no-who	4

Note. G = grammatical sentences; B = ungrammatical sentences; Fin = finite; NonFin = non-finite; ASP = aspectual marker.

Finite-clauses involve verbs with inflectional morphology such as *–guo* and *–zo* which mark past tense in Cantonese morphology whereas nonfinite-clauses involved verbs without any inflectional morphology. Types Fin.G and NonFin.G were the grammatical sentence structures with a Neg-whQ$_{obj}$, involving overt movement of Neg-whQ$_{obj}$ to preverbal position resulting in SOV word order; whereas types Fin.B and NonFin.B were related to the ungrammatical word order SVO, where Neg-whQ$_{obj}$ is ungrammatical because in-situ. Four tokens were dedicated to each type of sentence. On the other hand, the distractors involved constructions with referential object NPs and standard NegQs (e.g. *mou-jan* ‘nobody’). Finiteness was not included as variable in distractors, instead the two variables used to manipulate the distractors were: SVO versus SOV and object X versus object Y type. These are exemplified in Table 9.

Table 9: Control sentence types in the GJT

Type	Word Order	Object Type	Examples	No. of items
C_{NP}.G	SVO	Referential NP	Antony soeng hui luihan. Antony want to travel 'Antony wants to travel.'	2
C_{NegQ}.B		Ordinary NegQ	*Mary zungji-guo mou-jan. Mary like-ASP nobody	2
C_{NP}.B	SOV	Referential NP	*James cin zungji. James money like	2
C_{NegQ}.G		Ordinary NegQ	Matthew mou-je sik-guo. Matthew nothing eat-ASP 'Matthew ate nothing.'	2

Note. C_{NP} = controls with referential NP; C_{NegQ} = controls with ordinary NegQ; G = grammatical sentences; B = ungrammatical sentences; Fin = finite; NonFin = non-finite; ASP = aspectual marker.

Type C_{NP}.G is the grammatical SVO order with referential NPs and type C_{NegQ}.G is the grammatical SOV order with ordinary NegQs. Conversely, type C_{NP}.B is the ungrammatical SOV with referential NPs while type C_{NegQ}.B is the ungrammatical SVO with NegQs. These distractors were set to check the validity of participants' responses and also their basic competence of standard constructions with NPs and ordinary NegQs. Distractors with ordinary NegQs were used to test whether participants treat them differently from Neg-whQs in terms of overt movement.

A sentence was presented in written and aural form to participants on a laptop screen in PowerPoint. The author, who is a native speaker of Cantonese, recorded all the audio files of the sentences. Participants were allowed to listen to sentences as many times as they wished. The task for the participant was to judge how acceptable each sentence was on a four-point scale. A 'Can't decide' option was also allowed.

Table 10 shows the rating scale used on the answer sheet:

Table 10: Rating scale of the GJT

Is the sentence good, or bad?

Very bad. Unacceptable.	A bit bad. Not really acceptable.	Fairly good. Acceptable.	Perfectly good. Perfectly acceptable		Can't decide
–2	–1	+1	+2		X

Two trial sentences in the L2 learners' L1 were given before the task began in order to demonstrate how to use the rating scale: one grammatical and one ungrammatical sentence in English. It was explained that participants should judge a grammatical sentence like 'This is a good sentence' as acceptable and an ungrammatical sentence like 'This is a badder sentence' as unacceptable. Participants were advised that the negative ratings '-2' and '-1' indicated the sentence was bad and they could select either '-2' or '-1' as preferred; in contrast to the positive ratings '+2' and '+1' which indicated the sentence was good and they could select either on as preferred. The choice 'Can't decide' was given in case the participants were not sure of the answer. Instructions were given aurally and in writing on the answer sheet. Since the task was untimed, participants were told that they should only press the 'ENTER' key for the next slide if they were clear about instructions. An administrator (either the author herself or the Cantonese teacher) was always there in case there were any questions regarding the task before the task began. All test sentences were randomized and participants were asked to judge the acceptability of each sentence by circling a number on a scale as given in Table 10.

5.2.2.2. CONTEXT-BASED JUDGEMENT TASK (CJT)

This goal of this task was to look at learners' sensitivity to the existential reading derived from Neg-whQ_{obj} constructions. Following Dekydtspotter *et al.*'s study, the methodology of using written contexts is adopted. This task contained nine items, three distractors and six experimental items. Each item included a given context and five options for participants to select from. The five options include four different questions and a 'None of the above' option. Each context tells a story and provides background and presupposes either an existence or nonexistence of a future event. Among the six experimental items, half of them included contexts implying an existential reading, and the other half included contexts with negative reading. An example was displayed before this task began to help the participants understand the test mechanic (see Appendix 4). The given context in English and the 5 options were provided. The five options included four interrogatives (further details will be discussed) and a 'None of the above' option. The gloss translations for each option were only included for discussion here and they were not included in the real test. Instead, the Jyutping (phonetic transcription system) of each word was provided. Audio files of the context and 5 options were also played, starting from option A which was played immediately after the context, ending with option E 'None of the above'. Participants were generally guided to pick options relevant to the given context only and they were allowed to pick more than one option. Participants were reminded not to pick option E if they have chosen one or more of the previous options. When all audio files for a particular test item had been played, participants could choose to repeat audio sounds for any particular option by clicking a replay icon next to each option. Otherwise, the next test context and options were displayed by participants pressing the ENTER key.

Distractors were set to check participants' familiarity with the test format. They have the same format as described, but no Neg-whQ was used in the question options. In addition, only *wh*-phrases, ordinary (universal) quantifiers and *wh*-phrases with *dou*-quantification were randomly used in the given options. These questions either related back to what was mentioned or were completely unrelated to the context. Participants were asked to choose any possible option(s) from the five provided for the given context. As for the experimental items, the four question options interrogated either possible existential or non-existential interpretation following the statement 'I wonder'. Different yes-no or rhetorical questions were included intentionally to compare participants' responses to questions with Neg-whQ$_{obj}$ and other interrogatives such as *wh*-phrases licensed as NPI by preceding negation, ordinary NegQ and standard NPIs licensed by a preceding negation. In this study, the yes-no questions were those that typically ended with the question particle *aa*4 with falling tone as in (244) where responses are expected, while the rhetorical questions were those typically ending with the question particle *me*1 with rising tone as in (245) where responses were not necessarily expected but used to refer back to old information.

244.	Nei	zungji	sik	min	aa4?
	you	like	eat	noodles	Q

‘Do you like noodles?’

245.	Nei	zungji	sik	min	me1?
	you	like	eat	noodles	Q

‘Do you like noodles?’ (Lit. ‘You like to eat noodles. Don’t you?’)

These sentence types were prepared to find out whether learners treat Neg-whQs differently from *wh*-phrases licensed as indefinites or standard NegQ. In addition, the different question types ending with an SP of the *aa*4 or *me*1 type check faithfulness in selecting a question directly relevant to context. Table 11 presents the four types of interrogatives which made up the experimental items of the CJT.

Table 11: Option types in the CJT in the preliminary study

Option	Structure	Underlying interpretation	Example
A	Subj Neg-whQ_{obj} V?	Existential/negative	Mary *mou-bingo* soeng gin me1? Mary no-who want meet Q a. 'Doesn't Mary want to meet anybody?' (Lit. 'Mary wants to meet nobody. Doesn't she?') b. 'Does Mary want to meet only a few people?' (Lit. 'Mary wants to meet only a few people. Doesn't she?')
B	Subj Neg V wh_{obj}?	Negative	Mary mou soeng gin bingo aa4? Mary no want meet who Q 'Doesn't Mary want to meet anybody?'
C	Subj NegQ_{obj} V?	Negative	Mary moujan soeng gin me1? Mary nobody want meet Q 'Doesn't Mary want to meet anybody?' (Lit. 'Mary wants to meet nobody. Doesn't she?')
D	Subj Neg V NPI_{obj}?	Definite negative	Mary m soeng gin jamhojan aa4? Mary not want meet anyone Q 'Does Mary not want to meet anybody?'

Note. The arrow indicates the degree of negative interpretation to be used to interrogate negative contexts in native Cantonese.

As illustrated in Table 11, only option A allows both the non-existential and existential presupposition (i.e. a few people) to be questioned. Options B–D allow only a non-existential reading to be questioned. Option A is the key investigation type with the Neg-whQ_{obj}. Option B involves a *wh*-phrase being licensed as NPI by a preceding negation and sets a comparison to Option A, in testing learners' sensitivity to *wh*-phrases being licensed as indefinites. To contrast indefinites involving *wh*-elements, NegQ and NPI in option C and D are included as comparisons to option A and B. Option D involves the NPI, which is licensed by the preceding negation *m.* Its yes-no interrogative structure relates to a definite negative reading such as *There is not a single person that Mary wants to meet* or *Mary does not want to meet anyone*. Option C involves the NegQ *moujan* and refers only to a negative reading. Only the question structure in option A and B morpho-syntactically involve the *wh*-phrase. In addition, only option A allows both the existential and negative readings and it is the only interrogative structure type to be used by NSs among the four in colloquial existential contexts. The *wh*-phrase *bingo* in option B is licensed as NPI by the preceding *mou* and it cannot be a who-question with the particle *aa*4 with falling tone. Therefore, only the interrogative 'Mary doesn't want to meet anybody' can be used.

Example (246) illustrates the format of each test item, and represents an experimental item with an existential reading.

246. Experimental item with an existential reading:

Mary is a very busy person. She works long hours a day. In her spare time, she enjoys very much on her own except with her very close friends or family. Therefore she is very picky in choosing whom to meet with during weekends. Today is Saturday, I wonder:

☑ A) Mary *mou-bingo* soeng gin me1?
Mary no-who want tomeet Q
a. Lit. 'Mary wants to meet nobody. Doesn't she?'
b. Lit. 'Mary wants to meet only a few people. Doesn't she?'

☑ B) Mary mou soeng gin bingo aa4?
Mary no want to meet who Q
'Doesn't Mary want to meet anybody?'

☑ C) Mary moujan soeng gin me1?
Mary nobody want to meet Q
'Doesn't Mary want to meet nobody?'

☑ D) Mary m soeng gin jamhojan aa4?
Mary not want to meet anybody Q
Lit. 'Mary doesn't want to meet anybody. Doesn't she?'

□ E) None of the above.

In contexts allowing an existential reading as in (246), options A, B, C and D were possible questions to be used in existential contexts. Contexts were set such that questioning both existential and negative interpretations was possible. In example (246), the context hints that Mary actually meets her close friends or family in her spare time, but it is not clear that she would meet someone every weekend. The context clearly allows room to question whether Mary would meet nobody or of Mary would only meet a few people on that particular Saturday.

In the following, example (247) represents an experimental item with a negative context.

247. Experimental item example allowing only negative reading:

Mike is a very selfish and self-centered person. He minds his own business only and finds it a waste of time to care about others' business, not even his closest family or friends. I wonder:

□ A) Mike *mou-bingo* guansam me1?
Mike no-what care Q
a. Lit. 'Mike cares about nobody. Doesn't he?
b. Lit. 'Mike cares about only a few people. Doesn't he?'

☑ B) Mike mou guansam bingo aa4?
Mike no care who Q
'Doesn't Mike care about anyone?'

☑ C) Mike moujan guansam me1?
Mike nobody care Q
Lit. 'Mike cares about nobody. Doesn't he?'

☑ D) Mike mou guansam jamhojan aa4?
Mike not care anyone Q
'Doesn't Mike care about anybody?'

□ E) None of the above

In contexts allowing only negative reading, options B, C and D were possible questions to be used in negative contexts. In example (247), the context explicitly states that Mike cares about nobody. Questioning the negative interpretation acts as the speaker's request for affirming the claim, whereas questioning to confirm whether Mike cares about someone does not make sense when the speaker has just been given the negative information.

Table 12 presents the answer sheet given to all participants in the CJT:

Table 12: Choice sheet for the CJT

Which sentence(s) best match(s) the given context?

	A	B	C	D	E
Ex. 1					
Ex. 2					
Ex. 3					

All test items including the distractors were randomized. Participants were asked to choose their preferences by ticking corresponding box(es) under A, B, C, D or E as in Table 12. They were instructed clearly that they could choose more than one option when they found it appropriate, so they should not have felt inhibited about choosing more than one tick for each question.

5.2.2.3. PICTURE JUDGEMENT TASK (PJT)

This task was designed to answer the third research question (Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?) and test Slabakova's Bottleneck Hypothesis (2008). The predicted difficulty in acquiring Neg-whQs in L2 Cantonese is its complex morphology and the change of interpretation at the syntax-semantics interface with a Neg-whQ_{obj} construction having dual interpretation. By assuming L2 learners have their full L1 English grammar transfer to the initial-state of their interlanguage grammar, there is a lack of one-to-one morphological mapping between English *nowhere* (merge {no, where}) and Cantonese Neg-whQs (merge {mou, {Ø, *wh*-words}}), and an equivalent

[Quant:_] apart from [Neg] feature in the initial state of L2 learners interlanguage grammar. In addition, the PJT task aims in particular to ascertain whether successful 'feature assembly' (Lardiere, 2008, 2009) of the [Quant:_] feature in the interlanguage can take place.

With the full transfer of learners' L1 English grammar to the initial-state of their interlanguage grammar, learners are predicted to allow both subject-wide and object-wide scope readings of a doubly quantified construction given the L1 parameter relative to scope allows covert movement of quantifiers. To this effect, L2 learners are not expected to be able to distinguish the scrambled $\forall_{obj}$ Neg-whQ_{subj} V structure from the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V. Learners will incorrectly treat the scrambled structure as a free form of the non-scrambled one, since the knowledge of correct interpretation as a result of scrambling is underdetermined by their L1 English and L2 input. The subject-wide scope of the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V structure gives rise to the negative *Nobody eats every/all of the sandwich(es)* and triggers the possible existential reading *Somebody eats some sandwiches*, whereas the object-wide scope of the scrambled $\forall_{obj}$ Neg-whQ_{subj} V form gives rise to the ambiguity of both negative *For each sandwich, nobody eats it* and existential reading *For each sandwich, only a few people eat it* reading. The ambiguity is a result of the Neg-whQ_{subj} being preceded by the $\forall_{obj}$. While the non-scrambled structure allows for collective reading and possible distributive reading, the scrambled one allows only the distributive reading and the reading of *Nobody eats all of the sandwiches* is precluded. Therefore, L2 learners will have problems dissociating a collective reading from the scrambled form, if they treat the scrambled $\forall_{obj}$ Neg-whQ_{subj} V as a free form of the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V structure.

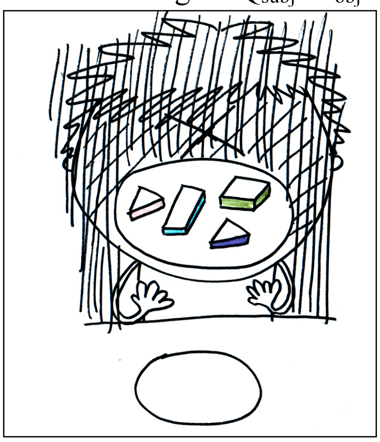
The PJT included 20 items, 10 experimental items and 10 distractors. All test items were randomized. The task was manipulated in such a way that participants could match sentences with pictures depicting a collective or distributive interpretations. Each test item comes with one sentence and one picture. The existential reading made available in the scrambled structure was excluded in the pilot study in order to avoid complication. Since all three tasks were completed in one go during piloting, there was no certainty participants would even noticed the possible existential reading of a Neg-whQ. Participants were asked to judge the acceptability of a sentence matching contextualized by a picture. Examples of two types of experimental items are given in (248) and (249).

248. Experimental item type 1 (Neg-whQ>$\forall$):
Mou-bingo muigo saammanzi dou sik.
No-who every sandwich also eat
'Nobody eats every sandwich.' (Collective)
(In other words, somebody wants to eat at least something.)

249. Experimental item type 2 ($\forall$>Neg-whQ):
Muigo saammanzi dou *mou-bingo* sik.
Every sandwich also no-who eat
a. 'For each sandwich, nobody eats it.' (Distributive)
b. 'For each sandwich, only a few people want to eat it.'

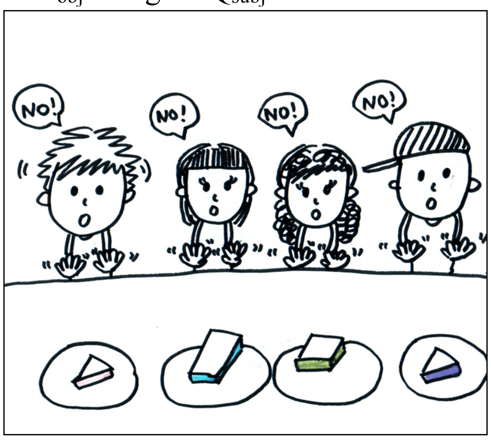
The experimental items examined the interaction of a Neg-whQ$_{subj}$ and a $\forall_{obj}$. Half of them only allowed a collective reading in a non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V structure as in (248); whereas the other half only allowed a distributive reading in a scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V structure as in (249). Pictures matching (248) and (249) are given in (250a) and (250b) respectively. The picture in (250a) matches with the collective interpretation in (248) while (250b) matches with the distributive interpretation in (249). For each sentence type, three out of five pictures were correct.

250. a. Neg-whQ$_{subj}$>$\forall_{obj}$



Picture a. displays the collective reading that there is nobody who eats all the sandwiches.

b. $\forall_{obj}$ >Neg-whQ$_{subj}$



Picture b. displays the distributive reading that there is nobody who eats any single one of the sandwiches.

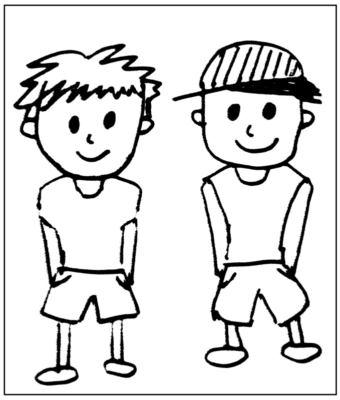
Two examples were given before the task began.

251. Examples:

a. Example 1:

They are all crying, nobody smiles.

b. Example 2:



The two boys are crying.

Example (251a) represents a correct matching of the sentence and picture pair, whereas (251b) represents an incorrect matching of the sentence and picture pair. Participants were instructed aurally that the cross on the face of the person under shadow means that this person does not exist. This was to help participants better understand the pictures in the real test items.

The distractors were used to check whether participants had paid attention to the pictures and given faithful responses. Also, their results could possibly help to check participants' understanding of the task format or the picture in general. There were two types of distractors, involving a negative-quantified NP_{subj} ($NegQ_{subj}$) and a numeric NP_{obj} (Num_{obj}) and they are given below:

252. Distractor type 1 ($NegQ_{subj} > Num_{obj}$):

Mou-daaijan	sik	loen-bui	syutgo.
No-adult	eat	two-cups	ice cream

'No adult eats two cups of ice cream.'

253. Distractor type 2 ($Num_{obj} > NegQ_{subj}$):

Loen-bui	syutgo	dou	mou-daaijan	sik.
Two-cup	ice cream	also	no-adult	eat

'For each of the two cups of ice cream, no adult eats it.'

The distractors involve the interaction of Negative-quantified NP_{subj} and a quantified NP_{obj}. In half of the distractors the Negative-quantified NP_{subj} precedes the quantified NP_{obj} as in (251), while the scrambled structure as in (252) made up the other half. Seven out of ten pictures were correct. All test sentences were randomized. Participants were asked to choose a number on a scale as given in Table 13.

Table 13: Rating scale of the PJT in the preliminary study

Is the sentence good or strange in the context of the picture?

Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
–2	–1	+1	+2		X

Any positive score ('+1' or '+2') that the participant assigned to the test item represented acceptance of an association between sentence and picture whereas a negative score ('-1' or '-2') represented rejection of association. The choice of 'Can't decide' was given in case the participants were unsure of the answer.

5.3. RESULTS OF THE PRELIMINARY STUDIES

5.3.1. GRAMMATICALITY JUDGEMENT TASK (GJT)

Two accuracy rates were calculated, one for grammatical and one for ungrammatical sentence types. The accuracy rate for grammatical sentence types was calculated by counting the number of positive scores and then dividing it by the total number of grammatical sentences (4). Only 1% of the total number of responses produced by all participants to the GJT were 'Can't decide's: 0% for the native group, 3% for the beginner group and 1% for the advanced learner group. Valid responses were also even distributed across sentence types which suggests no significant problem with the design of sentences according to type. Finally, only 3 out of 120 responses (3%) in the beginner group and 1 out of 384 responses (0.3%) in the native group were illegible and thus ignored for the purpose of analysis.

Mean accuracy rates for native Cantonese, beginners and advanced learners of Cantonese on control sentences are shown in Table 14.

Table 14: Item analysis of the GJT's control items in the preliminary study

Item	Beg (n=5)	Adv (n=5)	NS (n=16)
C_{NP}G01	1 (60%)	1.2 (100%)	1.69 (94%)
C_{NegQ}G02	0.6 (60%)	1.6 (100%)	1 (81%)
C_{NP}G03	1.75 (80%)	1 (80%)	2 (100%)
C_{NegQ}G04	1.4 (100%)	1.2 (80%)	1.63 (100%)
CG Mean	1.07 (80%)	1.25 (90%)	1.58 (94%)
C_{NP}B01	-1.5 (80%)	-0.8 (60%)	-1.56 (94%)
C_{NegQ}B02	-1 (80%)	0.4 (40%)	-1.75 (100%)
C_{NegQ}B03	-0.4 (60%)	0 (40%)	-1.75 (100%)
C_{NP}B04	-1.8 (100%)	0 (60%)	-1.13 (88%)
CB Mean	-1.12 (83%)	-0.1 (63%)	-1.55 (95%)
Overall Mean	82%	70%	95%

Note. C_{NP} = controls with referential NP; C_{NegQ} = controls with ordinary NegQ; G = grammatical sentences; B = ungrammatical sentences; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The overall mean accuracy rates from the three groups range from 70% to 95%. Three out of five advanced learners constantly picked a positive score (three out of four) for the ungrammatical control items, meaning they incorrectly accepted the ungrammatical SVO structure with $NegQ_{obj}$ and the ungrammatical SOV structure with NP_{obj}. However, the beginners outperformed the advanced learners on the ungrammatical control items. This raises a potential problem in grouping learners into the two proficiency levels according to their number of years studying Cantonese. Therefore, a Cantonese proficiency task to be described in detail in Chapter 6 was chosen for the main study.

Mean accuracy rates for the experimental items by native Cantonese, beginners and advanced learners of Cantonese are shown in Table 15.

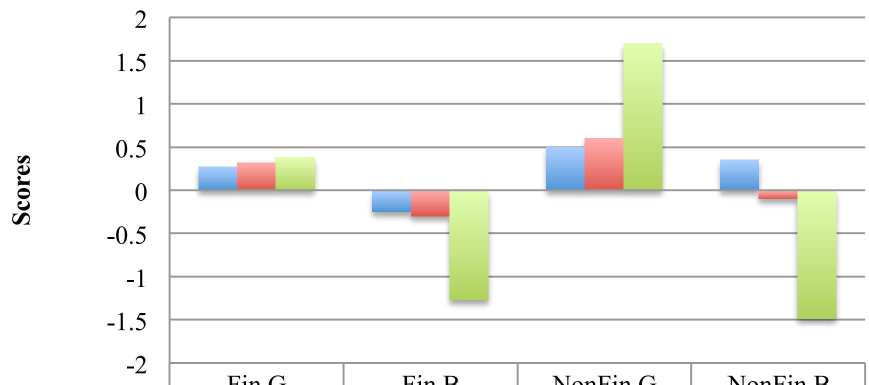
Table 15: Item analysis of GJT's experimental items in the preliminary study

Type	Beg (n=5)	Adv (n=5)	NS (n=16)
Fin.G	0.27 (58%)	0.32 (58%)	0.38 (64%)
Fin.B	-0.25 (45%)	-0.3 (60%)	-1.27 (84%)
Fin Mean	52%	59%	74%
NonFin.G	0.5 (60%)	0.6 (70%)	1.70 (100%)
NonFin.B	0.35 (30%)	-0.1 (55%)	-1.49 (94%)
NonFin Mean	45%	63%	97%
Overall mean	59%	64%	89%

Note. G = grammatical SOV sentences; B = ungrammatical SVO sentences; Fin = finite; NonFin = non-finite; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The overall accuracy rate on the experimental items of the GJT is in line with the prediction that the native group obtained the highest rate at 89%, followed by the advanced learners who obtained a rate of 64%, and the beginners with 59%.

Figure 1: Mean rating for experimental sentence types in the GJT in the preliminary study



	Fin.G	Fin.B	NonFin.G	NonFin.B
Beg (n=5)	0.27	-0.25	0.5	0.35
Adv (n=5)	0.32	-0.3	0.6	-0.1
NS (n=16)	0.38	-1.27	1.7	-1.49

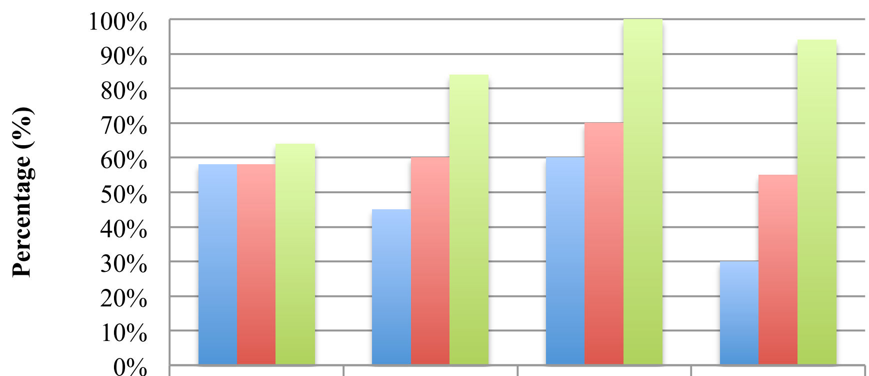
Note. G = grammatical SOV sentences; B = ungrammatical SVO sentences; Fin = finite; NonFin = non-finite; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

Looking precisely at the results of the experimental items, all groups tended to give positive mean scores for grammatical sentences and negative mean scores for ungrammatical sentences, except the beginners group whose mean rates to ungrammatical sentence constructions with nonfinite verbs were positive (middle bar in the far right cluster of Figure 1). All groups were in general more accurate on non-finite sentences than finite ones, even though, the L2 learners were more likely to reject ungrammatical finite sentences than ungrammatical nonfinite ones, as shown by the higher accuracy rate for Fin.B type than NonFin.B items. A repeated measures ANOVA with finiteness and grammaticality as independent variables and group as the dependent variable indicated a main effect of finiteness ($F_{1,23}$ = 18.286, p = .000, partial eta-squared = .443, power = .983), and grammaticality ($F_{1,23}$ = 17.097, p = .000, partial eta-squared = .426, power = .977), as well as a significant interaction of grammaticality and group ($F_{2,23}$ = 7.827, p = .003, partial eta-squared = .405, power = .922) and a three-way interaction of finiteness, grammaticality and group ($F_{2,23}$ = 10.088, p = .001, partial eta-squared = .467, power = .972) (see Appendix 6.2). However, a Games-Howell post hoc test indicated no significant difference between groups. Since participants were instructed that it did not matter if they picked '+1' or

‘+2’ for grammatical sentences and ‘-1’ or ‘-2’ for ungrammatical sentences, we then look at participants’ accuracy rates.

The accuracy rates in percentage for experimental sentence types by groups are displayed in Figure 2:

Figure 2: Accuracy rates in percentage for experimental sentence type in the GJT in the preliminary study



	Fin.G	Fin.B	NonFin.G	NonFin.B
Beg (n=5)	58%	45%	60%	30%
Adv (n=5)	58%	60%	70%	55%
NS (n=16)	64%	84%	100%	94%

Note. G = grammatical SOV sentences; B = ungrammatical SVO sentences; Fin = finite; NonFin = non-finite; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

A repeated measures ANOVA with finiteness and grammaticality as independent variables and group as the dependent variable indicated no main effect for finiteness, grammaticality, and group but an interaction between finiteness and group ($F_{2,23}$ = 6.995, p = .004, partial eta-squared = .378, power = .889), and between finiteness and grammaticality ($F_{1,23}$ = 6.646, p = .017, partial eta-squared = .224, power = .695) (see Appendix 6.3). A Games-Howell post hoc test showed a significant difference between the native and the advanced learner group (p = .027) whereas no significant difference was observed between the native and the beginners.

The structures of Fin-type and NonFin-type sentences are represented in (254 – 257) for convenience.

254. Fin.G type : Subj Neg-whQ_{obj} V[+past]
255. Fin.B type : *Subj V[+past] Neg-whQ_{obj}
256. NonFin.G type : Subj Neg-whQ_{obj} V
257. NonFin.B type : *Subj V Neg-whQ_{obj}

For Neg-whQ_{obj} constructions with finite verbs (Fin-type), the NSs performed the best among groups as expected. The native group obtained 64% accuracy rate on acceptance of Fin.G and 84% on rejection of Fin.B, with an overall 74% accuracy rate regarding finite verb types. That even the natives did not obtain 100% accuracy can be explained by the infrequent usage of this type of construction in colloquial Cantonese, given that there are many other standard NegQ alternatives to Neg-whQs. The natives were also more accurate in rejecting an ungrammatical structure than accepting a grammatical one, thus reflecting they had knowledge of the ungrammaticality of canonical SVO structure in combination with a Neg-whQ_{obj}. Both the beginner and advanced L2 learner groups obtained a 58% accuracy rate on acceptance of Fin.G sentences. The beginners obtained a relatively lower accuracy rate at 45% and the advanced learner group obtained 60% accuracy in rejecting Fin.B sentences. The overall mean accuracy rate for Fin-types of the advanced learners was 59%, which is slightly better than the beginners' 52%.

The native group obtained a very high accuracy rate with an overall 97% for NonFin-type (100% on NonFin.G type and 94% on NonFin.B type). The beginners had the lowest accuracy rate with NonF-types, obtaining 60% accuracy in accepting NonFin.G but only 30% accuracy in rejecting NonFin.B, whereas the advanced learners were 70% and 55% accurate in both respectively. In addition, the advanced group performed better than the beginner group and obtained an overall 623% accuracy while beginners obtained only 45% accuracy on NonFin-type experimental items. In general, L2 learners performed better in NonFin-types than Fin-types. As discussed previously, post hoc Games Howell tests showed only a significant difference between the NSs and the advanced learners ($p < .05$). Two follow-up repeated measures ANOVA with finiteness and grammaticality as the independent variables and group as the dependent variable between the native and beginner groups and between the native and advanced groups, showed that the difference is more significant between the native and beginner group ($F_{1,19}$ = 13.359, p = .002, partial eta-squared = .413, power = .934) than between the native and advanced groups ($F_{1,19}$ = 5.015, p = .037, partial eta-squared = .209, power = .566) (see Appendix 6.4 and 6.5).

5.3.2. CONTEXT-BASED JUDGEMENT TASK (CJT)

To analyze the results, the number of times a particular option being selected by all groups (option A – E) was calculated for distractor and experimental items (existential versus negative context). Recall that, as illustrated in the above section, there were no right or wrong answers in this task, but only preferred options according to the contexts. Therefore, a rate of reliability (RoR) is also used for analysis in the CJT, which is calculated by counting the number of participants selecting at least one of the possible questions used in the two context types respectively in the experimental items. Results of the distractor items from the native group proved the reliabilities of the task design, with the NSs selecting at least one of the correct options and at least two out of three of the distractor items 87% of the time (see Table 7.1.B in Appendix 7.1 for more details). Their responses showed the individual behavior reliability of the CJT and their genuine understanding of the test format. One individual participant NS06 performed differently from the general pattern and gave options that are unrelated to the given context for all distractor items. Thus, responses from NS06 were excluded from analysis for this task.

Table 16 shows the percentage of selection for each option and rate of selection for the experimental items.

Table 16: Item analysis of the CJT's experimental items in the preliminary study

Group	Option	Existential	Negative
	A	53%	40%
Beg (n=5)	B	13%	47%
	C	47%	53%
	D	67%	67%
	E	27%	0
RoR		100%	100%
	A	60%	87%
Adv (n=5)	B	33%	60%
	C	47%	73%
	D	47%	73%
	E	13%	7%
RoR		100%	80%
	A	44%	31%
NS (n=15)	B	24%	33%
	C	56%	36%
	D	29%	51%
	E	16%	20%
RoR		100%	87%

Note. RoR = rate of reliability, which is calculated by counting the number of participants selecting at least one of the possible questions used; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The RoR ranges from 80% to 100%, thus the data reflects faithful responses from all participants. Option E represents the 'None of the above' and examples (258 a – d) repeat the four question structures used in options A, B, C and D for convenience.

258. a. Neg-whQ_{obj} type: Subj Neg-whQ_{obj} V SP?

b. *Wh*-$word_{obj}$ (as NPI) type: Subj Neg V *wh*-$word_{obj}$ SP?

c. NegQ_{obj} type: Subj NegQ_{obj} V SP?

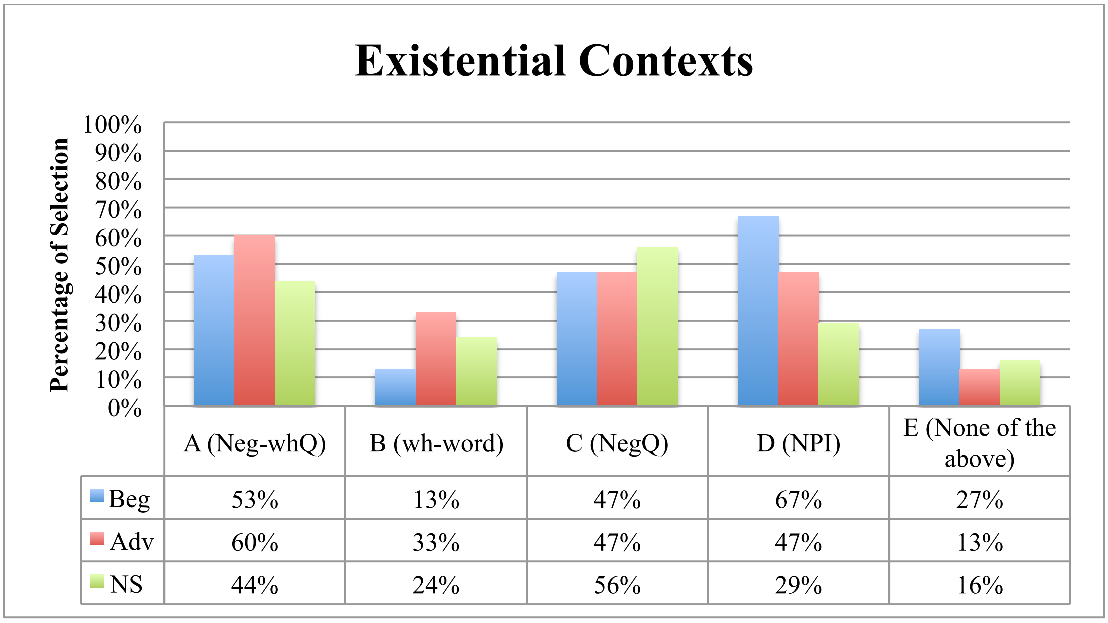
d. NPI_{obj} type: Subj Neg V NPI_{obj} SP?

The Neg-whQ_{obj} experimental type is the focus for the purpose of this CJT and NSs will prefer Neg-whQ_{obj} questions in existential contexts to negative ones according to the task design. Advanced learners had the highest selection of Neg-whQ_{obj} questions (option A) at 87% in negative contexts and 60% in existential contexts, while the other two groups' selections range from 31% to 40% in negative contexts and from 44% to 53% in existential contexts. Advanced showed a tendency to select option A in negative contexts over existential ones, whereas Cantonese natives and beginners in general preferred option A in existential contexts than the negative ones. A repeated measures ANOVA with context (existential versus negative) and option (A, B, C, D, or E) as independent variables and group as the dependent variable, showed the main effect of option ($F_{4,92}$ = 17.265, p = .000, partial eta-squared = .429, power = 1.000), a significant two–way interaction of context and option ($F_{4,92}$ = 3.057, p = .021, partial eta-squared = .117, power = .788) and a three-way interaction of context and option and group ($F_{8,92}$ = 2.291, p = .028, partial eta-squared = .166, power = .853) (see Appendix 7.2).[12] In both contexts, beginners selected option D whereas most of the time while advanced learners selected option A most of the time.

[12] Sphericity Assumed correction is used.

The data on existential contexts and negative contexts will be discussed in the following separately. Figure 3 in the following displays the percentage of selection for each option in existential contexts by group:

Figure 3: Percentage of selection for each option in existential contexts in the CJT in the preliminary study by all groups

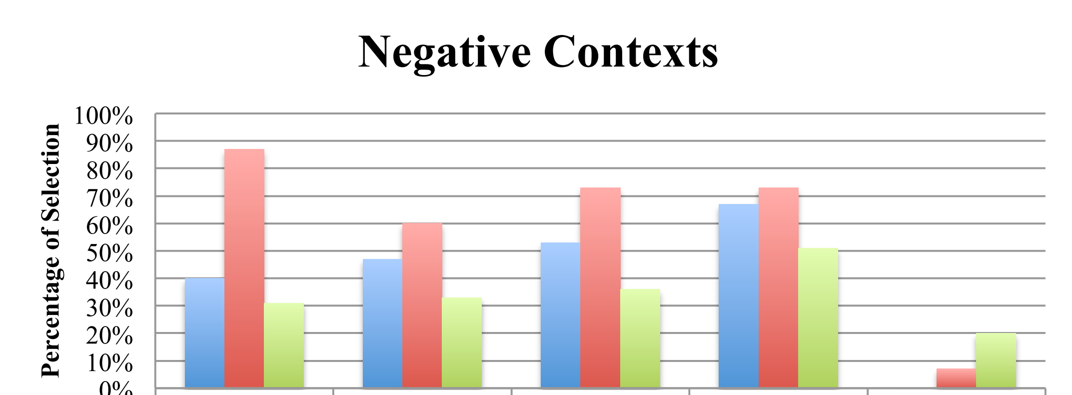


Note. NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The question types possibly be used in existential contexts for the experimental items were option A, B, C and D. As shown in Figure 3, the NSs tended to select option A the Neg-whQ_{obj} question structure (44%) and option C the NegQ_{obj} question structure (56%) in existential contexts. The learner groups in general preferred all questions types, option A the Neg-whQ_{obj} type, option C the NegQ_{obj} type and option D the NPI_{obj} type, except option B the *wh*-word$_{obj}$ type. Beginners showed 53% selection of option A, 47% of option C and 67% of option D while the advanced learners showed 60% selection of option A and 47% of both option C and option D. A follow-up one-way ANOVA on experimental items with option (A, B, C, D, or E) as independent variables and group as the dependent variable, indicated significant between groups effect only on option D in existential contexts ($F_{2,25}$ = 6.428, p = .006) (see Appendix 7.3). Post hoc Games Howell tests of a one-way ANOVA revealed that, beginners' selection of option D differed significantly from that by the NSs (p = .30). However, no between groups effect was found significant on the focus Neg-whQ_{obj} type.

Figure 4 displays the percentage of selection for each option in negative contexts by group:

Figure 4: Percentage of selection for each option in negative contexts in the CJT in the preliminary study by all groups



	A (Neg-whQ)	B (wh-word)	C (NegQ)	D (NPI)	E (None of the above)
Beg	40%	47%	53%	67%	0%
Adv	87%	60%	73%	73%	7%
NS	31%	33%	36%	51%	20%

Note. NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The question types possibly be used in negative contexts for the experimental items were option B, C and D. The Cantonese natives' responses accord the degree of negative interpretation to be used to interrogate negative contexts in native Cantonese as discussed in Table 11 (see section 5.2.2.2.). NSs showed a descending tendency of selection from option D to option A. The natives showed a 51% selection of option D, 36% of option C, 33% of option B and the least 31% selection of option A; the beginners displayed a similar pattern showing a 67% selection of option D, 53% of option C, 47% of option B and 40% of option A. However, the advanced learners showed the highest selection of option A at 87%. The same one-way ANOVA on negative data, with option (A, B, C, D, or E) as independent variables and group as the dependent variable, indicated significant between groups effect on option A ($F_{2,25}$ = 6.618, p = .005) (see Appendix 7.3). Post hoc Games Howell tests revealed that, for option A, the advanced learners' selection of option A differed significantly from that by the NSs (p = .001) and also from that by the beginners (p = .006).

Comparing the selection of option A in experimental items for both contexts, the native and beginner groups showed decreases in selections from existential to negative contexts whereas the advanced learners showed an increase in selections instead. Comparing the beginners' and advanced learners' selection of option A, a follow-up repeated measures ANOVA with context as independent variables and group as dependent variable was run (see Appendix 7.4). The statistics showed a significant interaction of context and group ($F_{1,8} = 7.200$, $p = .028$, partial eta-squared = .474, power = .653). Another follow-up repeated measures ANOVA with context as independent variables and group as dependent variable was run on L2 learners' selection of option A between NSs and advanced learners (see Appendix 7.6). The statistics showed a significant interaction of context and group ($F_{1,19} = 5.365$, $p = .032$, partial eta-squared = .220, power = .594). The results suggested that L2 learners, even achieving advanced proficiency level, performed differently from the NSs. In addition, the results showed that participants' selection of different options differed between existential and negative contexts.

5.3.3. PICTURE JUDGMENT TASK (PJT)

Two scores will be considered: mean rates and accuracy rates. The mean rate is the average of selected scores from the scale of '-2', '-1', '+1' and '+2'. The accuracy rate on the PJT was calculated by dividing the number of positive scores by the number of correct sentence picture pairs, and dividing the number of negative scores by the number of incorrect sentence picture pairs. Due to the small sample of each learner group and the 'Can't decide' responses only reflecting participants' difficulties, thus no participant was neglected for the purpose of piloting. However, it is decided that any 'Can't decide' or illegible responses would be ignored in the data analysis. The mean rates and accuracy rates for the distractors are displayed in Table 17.

Table 17: Item analysis of the PJT's distractor items in the preliminary study

Type	Beg (n=5) mean (Acc)	Adv (n=5) mean (Acc)	NS (n=16) mean (Acc)
DG	1.15 (77%)	1.53 (89%)	1.43 (90%)
DB	0.73 (27%)	0.53 (33%)	1.06 (17%)
Average Acc	51.90%	60.95%	53%

Note. Acc = for Accuracy Rate; G = correct sentence picture pair; B = incorrect sentence picture pair; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The performances of all groups for correct sentence picture pair ranged from 77% to 90% accuracy. However, all groups obtained a low accuracy rate on distractors with incorrect sentence picture pair. All participants showed a low tendency in rejecting the mismatch, contra expectations. Re-examination of individual distractor items suggested that the task design of the PJT required refinement.

The two types of experimental items are repeated in (259 – 260) for convenience.

259. Non-scrambled Neg-whQ$_{subj}$ >$\forall_{obj}$ type:
Mou-bingo muigo saammanzi dou sik.
No-who every sandwich also eat
'Nobody eats every sandwich.' (Collective)
(In other words, somebody wants to eat at least something.)

260. Scrambled $\forall_{obj}$ >Neg-whQ$_{subj}$ type:
Muigo saammanzi dou *mou-bingo* sik.
Every sandwich also no-who eat
a. 'For each sandwich, nobody likes it.' (Distributive)
b. 'For each sandwich, only a few people like it.'

The mean rating and the accuracy rates for all experimental items are displayed in Table 18.

Table 18: Item analysis of the PJT's experimental items in the preliminary study

Type	Beg (n=5) mean (Acc)	Adv (n=5) mean (Acc)	NS (n=16) mean (Acc)
Neg-whQ$_{subj}$ >$\forall_{obj}$.G	0.2 (47%)	-0.57 (33%)	0.04 (48%)
Neg-whQ$_{subj}$ >$\forall_{obj}$.B	1.5 (0%)	1.1 (20%)	0.88 (15%)
Mean	23%	27%	32%
$\forall_{obj}$ >Neg-whQ$_{subj}$.G	1.33 (67%)	1.33 (80%)	0.79 (79%)
$\forall_{obj}$ >Neg-whQ$_{subj}$.B	1 (10%)	0.9 (20%)	0.44 (34%)
Mean	41%	44.93%	57%
Overall mean	33%	36%	44%

Note. Acc = for Accuracy Rate; G = correct sentence picture pair; B = incorrect sentence picture pair; NS = native speakers of Cantonese; Beg = beginners; Adv = advanced.

The overall performances from all groups were below standard ranging from an overall accuracy rate of 33% to 44%. The native group performed below 50% accuracy rate in both experimental sentence types, obtaining a mean of 32% on non-scrambled Neg-whQ$_{subj}$ >$\forall_{obj}$ sentences allowing only collective readings and 57% on scrambled $\forall_{obj}$ >Neg-whQ$_{subj}$ sentences allowing only distributive readings.

The results of the experimental sentences with collective reading suggest the pictures or the task design were problematic. On the one hand, no more than half of the native rated correct sentence picture pairs of the non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V items positive, while they incorrectly rated incorrect sentence picture pairs positive most of the time. On the other hand, although 79% of the responses from the NSs correctly rated the correct sentence picture matching of the scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V items positive. In addition, the NSs also gave a positive rating to sentence picture mismatch items incorrectly which lead only a 34% accuracy rate in correctly rejecting the mismatch. In fact, all groups were more accurate in accepting the correct sentence picture pairs of the scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V items. A repeated measure ANOVA with reading type (collective versus distributive) and matching (correct versus incorrect) as the independent variables and group as the dependent variable, showed a main effect of reading type

($F_{1,\,23}$ = 11.068, p = .003, partial eta-squared = .325, power = .890) and matching ($F_{1,\,23}$ = 18.480, p = .000, partial eta-squared = .446, power = .984) but no group differences and no interaction (see Appendix 8.2 for more results). The results from the native group were not as predicted according to the original task design. It is found that the pictures did not include all possible readings of the experimental sentences after re-examination of the materials. Thus, refinements on the design and materials of the PJT were made in the main study.

5.4. FINALISED MATERIALS AND PROCEDURE FOR THE MAIN STUDY

5.4.1. GRAMMATICALITY JUDGEMENT TASK (GJT)

The results from this piloting experiment prove the validity of the GJT. However, it is necessary to increase the number of test items for each type to make sure that differences in participants' mean rate and rate of accuracy on a particular types of test items are not random. Therefore, the total number of experimental items was raised from 16 to 24 and the number of control items was raised from 8 to 12.

Six tokens were created for each experimental type, versus the four in the pilot study. The main study will be split into two sections, the amendment allowed an extension of the GJT in the first section. Increasing the number of test items in the GJT allows a greater reliability to participants' responses.

5.4.2. CONTEXT-BASED JUDGEMENT TASK (CJT)

The purpose of the analysis in the pilot study was to check reliability of the task design. The task design was re-examined after consideration, that amendments to the context design and sentence types to be included are necessary. This is because this task was designed to test participants' awareness of the existential reading of a Neg-whQ_{obj} construction by associating such construction to contexts with existential readings. One of the variables manipulated in the design is context (existential versus non-existential). Therefore items in the CJT were revised after previous piloting by including different sentence structures, refining the context design and increasing the total number from 9 to 18, six distractors plus 12 experimental items. Among the 12 experimental items, half of them included contexts with existential readings and half of them included contexts with negative readings. The sentence structures given in the options were amended from interrogative to declarative structures. The four sentence types were revised and are shown in Table 19.

Table 19. Sentence types for experimental items of the CJT to be used in the main study

Option	Sentence structure	Involved reading(s)
A	Subj Neg-whQ$_{obj}$ V SP$_{[+p]}$ (SOV structure with a Neg-whQ$_{obj}$) e.g. I no-what like zaa$_3$	Existential 'only a few' (Lit. 'I like only a few things.')
B	Subj Neg V NPI$_{obj}$ (SVO structure with a negator and a negative polarity item) e.g. I don't like anybody	Negative (Lit. 'I don't like anybody.')
C	Subj NegQ$_{obj}$ V SP$_{[-p]}$ (SOV structure with ordinary negative quantifier object) e.g. I nobody like aa$_{(neutral)}$	Negative (Lit. 'I like nobody.')
D	Subj V Few$_{obj}$ SP$_{[+p]}$ (SVO structure with 'only a few' object) e.g. I like only a few people zaa$_3$	Existential 'only a few' (Lit. 'I like only a few things.')
E	'None of the above'	

Instead of using the interrogative structure, a declarative structure was used in all options, such that there is a straightforward relation between the designed contexts (existential versus negative) and the given sentence types.

The following is an example of a revised experimental item with an existential context:

261. Peter once went to Thailand for a relaxing trip because he likes beaches and sunshine. That was his only trip abroad. Normally, he is not an adventurous person and he lives a very dull life in the UK. On weekdays, he goes to work in the early morning and comes home right after work. At weekends, he simply stays home and only goes out when it is necessary. I think:

☑ A) Peter *mou-bindou* zungji hui ze1

Peter no-where like go SP

a. 'Peter doesn't like to go to anywhere!'

b. 'Peter likes to go to only a few places!'

□ B) Peter mou zungji hui jamho-deifong

Peter not like go any-place

'Peter doesn't like to go to any places.'

□ C) Peter mou-deifong zungji hui gaa3

Peter no-place like go SP

'Peter likes to go to no places!'

☑ D) Peter zungji hui housiu deifong zaa3

Peter like go a few place $SP_{\text{-only}}$

'Peter likes to go to only a few places!'

□ E) None of the above.

The above (261) is an example of experimental item with an existential context. English translations of each response option are provided here for the convenience of discussion, but they were not included in the actual test. Options A and D are the presumably correct responses to the context referring to the fact that Peter only went to Thailand once before and enjoys going to places limited to wherever with beaches for example. The procedure was the same except each test item began with the context presented in written form and aurally, in English, for learners, and in Cantonese for NSs in the main study. Then, each context was followed by each option in aural and in written representations one by one. Option A involves the construction with a Neg-whQ_{obj} and $SP_{[+p]}$ (Neg-whQ+$SP_{[+p]}$), in which 'only a few' reading is pushed, and represents the key investigation in the CJT. The purpose of investigation in the CJT is to discover the extent to which participants prefer Neg-whQs in the designed existential[13] rather than negative contexts. In addition, the CJT was deigned to investigate L2 Cantonese learners' awareness to the existential 'only a few' reading of a Neg-whQ+$SP_{[+p]}$ construction of option A. Option B, C, and D were designed for comparison with option A. Both option B and C where negation licensing NPI and a NegQ_{obj} are used respectively. These two options allow only negative readings and were included as control types to experimental items with negative contexts. Option B and C were included to check the validity of the negative reading in the negative contexts and participants' correct association of these two structures with negative contexts. When the context sets up an existential reading, option B and C should not be selected. Option C with a NegQ_{obj} in particular, was set as a comparison to option A sentences with Neg-whQ_{obj} to test participants' acceptance of the SOV word order. Option D was included as a control type to check the validity of the 'only a few' reading in the existential contexts and participants' correct association of the 'only a few' reading with existential contexts. In addition, option D compared with option A in relation to 'only a few' readings. When the context sets up a negative reading, option A and D should not be selected. If participants selected option A and D at the same time, it shows they were aware of the existential reading of a Neg-WhQ_{obj}.

[13] In the rest discussion, it will also be referred as 'only a few' reading.

Example (262) is another example of an experimental item with a negative context:

262. Dorothy is a shopaholic and has no savings at all. Usually on the last few days of each month, she can hardly afford to buy food and she definitely cannot afford restaurants. It is the last day of the month, and she spent every penny of her salary days ago. I am sure today:

□ A) Dorothy *mou-matje* maai-guo ze1
Dorothy no-what buy-PFV SP
a. 'Dorothy bought nothing!'
b. 'Dorothy bought only a few things!'

☑ B) Dorothy mou maai-guo jamho-je
Dorothy not buy-PFV any-thing
'Dorothy didn't buy anything.'

☑ C) Dorothy mou-je maai-guo aa3
Dorothy no-thing buy-PFV SP
'Dorothy bought nothing!'

□ D) Dorothy maai-guo housiu je zaa3
Dorothy buy-PFV a few thing SP_{-only}
'Dorothy bought only a few thing!'

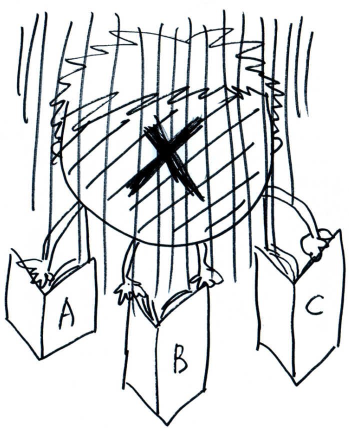
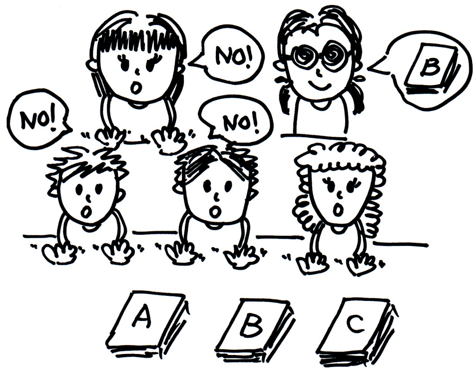
□ E) None of the above

In experimental items with negative contexts, option B and C were the correct responses. Details of instructions, examples used and distractor items are presented in Appendix 11.2. The CJT belongs to the second section of the main study, therefore unreliable responses due to laziness or tiredness having participated in a long test including all three tasks are avoided in the real experiment.

5.4.3. PICTURE JUDGMENT TASK (PJT)

In the main study, there remained altogether 20 test items in the PJT. Among the 20 items, half were distractor items and half were experimental items. In each test item, a test sentence and a pair of pictures depicting possible interpretations from the sentence were presented, instead of one sentence one picture method in the pilot study. The experimental items included five sentence-pair sets of a doubly quantified construction with a Neg-whQ$_{subj}$ and a $\forall_{obj}$, either in its non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V structure or its scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V counterpart. The audio sentences were carefully refined to represent prosodic structures of the scrambled sentences. Table 20 gives details and examples of the revised experimental items:

Table 20. Revised experimental items of the PJT for the main study

Information	Non-scrambled	Scrambled
Type	Neg-whQ > $\forall$	$\forall$ > Neg-whQ
Structure	Neg-whQ$_{subj}$ $\forall_{obj}$ V	$\forall_{obj}$ Neg-whQ$_{subj}$ V
Example	*Mou-bingo* mui-buin sju dou seung taai No-who every-CL book also want read 'Nobody wants to read all the books.' (In other words, 'Somebody reads some books.'	Mui-buin sju dou *mou-bingo* seung taai Every-CL book also no-who want read 'For each one of the books, there is nobody/only a few people who want(s) to read it.'
Reading	Collective	Distributive + 'Only a few'
Corresponding picture		

The PJT was also revised to include 10 distractors made up of five sentence-pair sets of a $NegQ_{subj}$ and a Num_{obj}. Table 21 illustrates the revised distractors for the main study:

Table 21. Revised distractor items of the PJT for the main study

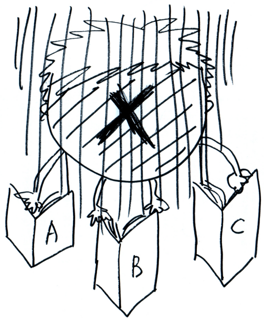
Information	Non-scrambled	Scrambled
Type	NegQ > Num	Num > NegQ
Structure	$NegQ_{subj}$ Num_{obj} V	Num_{obj} $NegQ_{subj}$ V
Example	Mou-daaijan sik loen-bui syutgou No-adult eat two-cup ice-cream 'No adult eats two cups of ice-cream.'	Loen-bui syutgou dou mou-daaijan sik Two-cup ice-cream also no-adult eat 'For the two cups of ice-cream, there is no adult who eats any of them.'
Reading:	Subject-wide	Object-wide
Corresponding picture		

Five changes were made to the test design of the PJT after previous pilot testing. First, pictures designed for the distributive reading were redesigned such that the 'only a few' reading was also depicted as presented in the right column in Table 20 previously. Second, two pictures from the corresponding sentence-pair set were provided below the test sentence at the same time. All sentence-picture pairs are displayed in Appendix 11.3. Participants were asked to rate the two pictures and to judge the possibility of the test item in associating to the interpretation derived from each of the pictures.

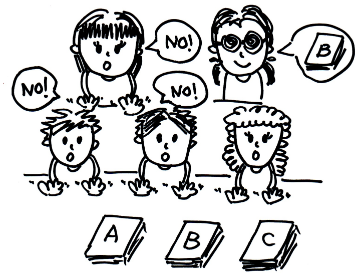
The two pictures were displayed at the same time, as picture A and picture B. The two pictures were labeled as A and B randomly throughout the test as exemplified in (263), with the mismatching picture on the left and matching picture on the right. The position, either left or right, of either the matching or mismatching picture appearing in is randomized.

263.	Mui-buin	sju	dou	*mou-bingo*	seung	taai
	every-CL	book	also	no-who	want	read

A. Mismatch



B. Match



The methodology of presenting parallel interpretations is supported by Lee (2009) for better evaluation. Therefore, displaying the two pictures at one time was intended to enable a better contrast between the two readings so that the participants could make a more accurate judgement. Third, the rating scale is revised for the main study and it is presented in Table 22. Participants were advised to choose a number on the scale as given in Table 22, to indicate how well the given sentence matched the pictures. Negative scores ('-2' and '-1') corresponded to impossible matching whilst positive scores ('+1' and '+2') corresponded to very good matching. A 'Can't decide' option was also included.

Table 22. Revised rating scale of the PJT for the main study

Is the sentence good, or strange, in the context of the picture?

		Very strange. Impossible.	**A bit strange. Not really possible.**	**Fairly good. Possible.**	**Perfectly good. Perfectly possible**	**Can't decide**
Q	A	–2	–1	+1	+2	X
	B	–2	–1	+1	+2	X

Forth, participants were also advised not to give the same score for both pictures in the test item. Fifth, audio presentations of all test sentences were re-recorded. Since participants to the preliminary study seemed to have trouble understanding all test sentences, the scrambled ones in particular, slowing down the pace and inserting pauses were therefore taken into account for all recordings of the PJT in the main study.

5.5. SUMMARY AND LIMITATIONS

This chapter has described the participants, materials, procedures, and results of three tasks, namely a GJT, CJT, and PJT. The limitations of the preliminary studies are the small sample of participants in the learner groups and the small number of test items in each context type in the CJT. More participants will be recruited in the main study. Also, the measure of proficiency did not appear to be faithful to the L2 learners' real competence in the L2. L2 Learners' proficiency was based simply on their years of L2 instruction. However, a few individuals at the beginner level performed better than the advanced level which affected the results in comparing learners at different proficiency of this pilot study. Therefore, a Cantonese proficiency test before the main study was devised for the main study (detailed in Chapter 6). In addition, there are drawbacks to all three tasks into one testing session. Feedback from native participants reflect their lose of concentrate and patience at the end of the test. This was also reflected in the results of the PJT. Therefore, the three tasks were completed in two separate testing sessions, on separate occasions. The first section will include the GJT and the PJT while the second session will include the CJT. In contrast to the preliminary studies that used English instructions and contexts in the CJT, NSs were asked to complete a Cantonese version of the test, in which all instructions and contexts in the CJT were written or aurally presented in Cantonese for the main study. The scale of the main study was expanded for a precise investigation. The response to the three research questions is revealed in Chapter 6 with an expanded numbers of test items in each task and expanded numbers of participants in the main study.

CHAPTER 6

THE MAIN STUDY: METHOD, RESULTS AND DISCUSSION

6.1. INTRODUCTION

This chapter presents the results from the main experimental study conducted to investigate the three research questions in order to test the one part of Schwartz and Sprouse's (1994, 1996) FT/FA Hypothesis model and Slabakova's Bottleneck Hypothesis (2006, 2008, 2010). The two research questions are addressed in (264 – 266). Specifically, the first aim of this study is to revisit FA by looking at whether adult learners with L1 English can achieve native-like competence in knowledge of colloquial Cantonese Neg-whQs. By adopting my own proposal of the internal complex of the (Neg-wh)QP structure of Neg-whQs as a kind of *wh*-quantifier, there is no one-to-one morphological mapping of Neg-whQs in the learners' L1 English and L2 Cantonese. While the English counterpart *nowhere* has a simpler morphological structure ({no, *wh*-word}) and inherits a [Neg] feature from its head; Cantonese Neg-whQs have a complex morphological structure ({mou, {Ø, *wh*-word}}) and inherit both [Neg] and [Quant:_] features. Second, this study will investigate whether the proposed quantifier operator Ø within the complex morphology is a 'bottleneck' in English Cantonese interlanguage.

The three tasks, a grammaticality judgement task (GJT), a context-based judgement task (CJT), and a picture judgement task (PJT), were used to investigate three properties relative to the acquisition of Neg-whQ in L2 Cantonese: SOV word order at the level of syntax, dual interpretations at the level of semantics, and the change of readings dependent on scrambling in doubly quantified constructions at the level of both syntax and semantics.

To follow, the three research questions are repeated below:

264. Can English-speaking learners of Cantonese acquire the syntax and semantics of a Neg-whQ_{obj} construction?

265. Does the absence of a [Quant:_] feature in the learners' L1 English play a role in their acquisition of the dual reading of Cantonese Neg-whQs?

266. Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?

Following the discussion in Chapter 3, it is clear that properties of Neg-whQs are in Cantonese and absent in English grammar. Research question one (264) questions the possibility of L2 acquisition of the SOV structure and the additional existential 'only a few' reading of a Neg-whQ_{obj} construction in L2, in which these properties are absent in any negative quantifiers in the learners' L1. Research question two (265) examines whether or not the additional [Quant:_] feature, which is absent in L1 feature set, is successfully added to the learners' L2 Neg-whQ feature set to achieve L2 acquisition of Neg-whQs. The addition of a [Quant:_] feature is also required to achieve native-like competence in the dual interpretation of Neg-whQs, at the semantic level, as well as the successful L2 acquisition of the change of reading that is dependent upon scrambling in a doubly quantified construction, at the syntax-semantics interface. In addition, research question three addresses the learnability problem postulated in Chapter 4 that the complex morphology of Neg-whQs is a 'bottleneck' in adult L2 acquisition.

English-speaking Cantonese learners were selected as participants to this study because there is no one-to-one morphological mapping of Neg-whQs in English and Cantonese. Taking findings from the pilot study (See Chapter 5) into account, section 6.2 presents hypotheses made with reference to the learning difficulty postulated (see Chapter 4) and by assuming FT of learners' L1 grammar to the interlanguage grammar. The details of the experimental procedure of the main study are presented in section 6.3. In particular, the revised procedure, background of recruited participants and the Cantonese proficiency test conducted before the real experiment are detailed. The main findings of the three tasks involved in this research project are presented in section 6.4, section 6.5, and section 6.6 accordingly. Finally, section 6.7 concludes the findings and answers the three research questions.

6.2. HYPOTHESES

Following Lardiere's (2005, 2008, 2009) Feature Reassembly Hypothesis that was built on Schwartz and Sprouse's (1994, 1996) FT/FA Hypothesis model, English-speaking learners of Cantonese are expected to rely on their L1-based feature set in the interlanguage grammar of L2 development, and adding the missing [Quant:_] feature is required in order to achieve successful L2 acquisition. By assuming that the L1 grammar transfers in full, the [Neg] feature will be present in English-Cantonese interlanguage grammar. In light of the above, hypotheses (267 – 270) are formulated according to the three phases.

267. Syntax of Neg-whQs:

- HYPOTHESIS 1:

  Intermediate learners will correctly accept the SOV order of a Neg-whQ$_{obj}$ construction with nonfinite verbs and incorrectly reject those with finite verbs, whereas advanced learners will correctly accept the correct SOV order and reject the incorrect SVO order regardless of finiteness.[14]

---

[14] As discussed previously in Chapter 3, the finiteness of the main verb in the embedded clause creates a blocking effect for optional long distance movement in bi-clausal sentences; and the variable of finiteness was originally designed in a small-scale pre-piloting involving both mono- and bi-clausal sentences in the GJT that is not reported in Chapter 5. However, results from this task of the pilot test reported in Chapter 5 show that learners were performing more accurate in test items with nonfinite verbs than finite ones. In addition, the variable of finiteness has an interrelated relationship with the availability of the existential reading of object Neg-whQs. Example (124) is repeated below:

e.g. Keoi *mou-matje* maai-zo.
he no-what buy-PFV

a. *'He bought nothing.'

b. b. 'He bought only a few things.'

As suggested by Cheng et al. (1996, p.68), *mou* as a negator is used with various aspects and accomplished verbs only. It cannot be used with the perfective aspectual marker *-zo* and can be interpreted as perfective on its own. If intermediate learners associate Neg-whQs with only the negative reading, that Neg-whQ precedes an aspectual marker would appear ungrammatical to them.

268. Semantics of Neg-whQs:

EITHER: Failure to add the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 2: L2 learners, regardless of their proficiency level, will fail to acquire the implied existential interpretation of Neg-whQ+$SP_{[+p]}$ constructions. They will reject these constructions in existential contexts and accept them only in negative contexts.

OR: Success in adding the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 3: Advanced learners, but not intermediate learners, will correctly accept the implied existential interpretation of Neg-whQ+$SP_{[+p]}$ constructions in existential contexts but not negative contexts.

269. Neg-whQs at the syntax-semantics interface:

EITHER: Failure to add the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 4: Both groups of learners, regardless of proficiency level, will associate non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V sentences with both collective and distributive readings, but incorrectly reject the distributive and existential 'only a few' readings and accept the collective reading associated to scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences.

OR: Success in adding the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 5: Both intermediate and advanced learners will associate non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V sentences with both collective and distributive readings. However, in scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences, intermediate learners will incorrectly reject the distributive and existential 'only a few' reading and accept the collective reading, whereas advanced learners will do the opposite.

270. HYPOTHESIS 6: Neither the intermediate nor advanced learners will acquire the correct interpretations in scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences without acquiring the existential reading of Neg-whQs.

Hypothesis 1 is prediction about the performance of L2 learners at different proficiency. They are formulated to test the innate mechanism of UG in the FT/FA model. There are two reasons why we predict that Neg-whQ will not be successfully acquired until later stages of L2 development. The first reason is the lack of one-to-one morphological mapping of Neg-whQs in English and Cantonese. While English *nowhere* has a simpler {no, *wh*-word} structure, Cantonese Neg-whQs have a complex {mou, {Ø, *wh*-word}} structure. The learners' Cantonese proficiency is a variable in successful L2 acquisition. Given more exposure to the L2 input, advanced learners are predicted to outperform the intermediate learners at syntax and semantic level. The second reason is the absence of negative quantifiers in English having both negative and existential readings. Hypothesis 2 and 3 are formulated in relation to learners' acceptance of the Neg-whQ_{obj} construction in existential contexts according. The third reason is the POS problem represented by the additional existential reading made available in the scrambled $\forall_{obj}$ Neg-whQ_{subj} V structure, given that there is neither one-to-one morphological mapping of Neg-whQs nor scrambling in English. The knowledge of the change of reading depending on scrambling is underdetermined by the learners' L1 English and L2 Cantonese input at the syntax-semantics interface. Hypothesis 4 and 5 are formulated to test Full Access depending on whether or not there will be evidence of successful acquisition in the domains of syntax and semantics at an advanced stage of L2 learners' English-Cantonese interlanguage. Note that in (268 – 269), two sets of alternative hypotheses are presented, depending on whether the [Quant:_] feature is added to the feature set of Cantonese Neg-WhQs with continuous exposure to the L2 input. Hypothesis 6 is formulated to test whether the complex morphology of Neg-whQs is a 'bottleneck' to L2 learners and whether L2 acquisition of Neg-whQ will be delayed in the late state. If L2 learners could not master the complex morphology, in which the [Quant:_] feature is crucial, they would fail to acquire the existential reading of an Neg-whQ_{obj} constructions and the correct interpretations in scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences, regardless of their proficiency level.

6.3. REVISED EXPERIMENTAL DESIGN: FURTHER DETAILS

6.3.1. PARTICIPANTS

In order to obtain adequate sample sizes, participants were recruited from different places in Hong Kong. Learner participants needed not necessarily be only from classroom situations but could also be English-speaking learners of Cantonese who had been living in Hong Kong for many years as well. This allows recruitment of learners who are as proficient as possible, in order to investigate the real difficulty in L2 acquisition of Neg-whQs even to learners achieving advanced proficiency. English-speaking learners of Cantonese were recruited at a private Cantonese teaching institute (Gaby's ChatRoom),[15] two universities in Hong Kong (University of Hong Kong and City University of Hong Kong) and from English-speaking communities in Hong Kong; Cantonese native control participants were recruited from a large pool of the author's friends in Hong Kong.

Data from 59 L1 English speakers of Cantonese (L2 learner group) and 56 NSs of Cantonese as controls were collected.[16] The L2 learner group was divided into 'intermediate' and 'advanced' sub-groups according to their scores on a Cantonese proficiency test.

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[15] Registration Certificate No. 50991043-000-08-13-6 dates 03/08/2013 to 02/08/2014.

[16] The native Cantonese speakers from the control group understood English (English is the official second language in HK) and most of them had already obtained a bachelor degree or had some experience of higher education.

Table 23 summarizes details of the participants.

Table 23: Main Study – Participants (Control and Cantonese Learners)

Group	No.	Age Mean (Range)	Years Learning Cantonese (y;m) Mean (Range)	Years Living in Hong Kong (y;m) Mean (Range)	Proficiency Test Scores Mean out of 20 (Range)	Details
NS	56	27 (17-51)	N/A			Residents of HK
Int	30	31 (21-48)	1;10 (0;2-6;0)	3;3 (1;0-8;0)	17.03 (16-18)	20 students at Gaby's ChatRoom; 10 international students studying at universities in HK
Adv	29	39 (24-67)	9;2 (0;5-30;0)	9;1 (0;2-29;0)	19.83 (19-20)	7 students at Gaby's ChatRoom; 5 teaching associates at university in HK; 17 from English-speaking communities resident in Hong Kong

Note. NS = Cantonese Native speakers; Int = Intermediate; Adv = Advanced.

Since the aim of the experimental study is to revisit FA and test whether L2 learners at advanced levels can overcome difficulties in the L2 acquisition of colloquial Neg-whQs, we required learners who master basic communication in Cantonese daily contexts. Those who scored below 19 out of 20 were classified as intermediate and those scored 19 or 20 were classified as advanced. Among the L2 participants, all the intermediate learners and 7 of the advanced learners had learnt Cantonese in a classroom context, and they had been exposes to a Cantonese-speaking environment. The rest of the participants, namely 22 advanced L2 learners, had resided and worked in HK all their lives. Hence, most of the advanced learners were naturalistic learners who were obliged to speak Cantonese in their work environment in Hong Kong. All L2 participants were adult learners of Cantonese whose age ranged between 21 to 67. None of the L2 learners were bilingual, but some of them had learnt to speak other L2s including Chiu Chow (a Chinese dialect), Nepali, Spanish, Tok Pisin and Vietnamese. All participants volunteered to take part in the experiment and understood the purpose of the study beforehand. Four of the advanced learners did not follow up for the real test and therefore the sample size for the advanced learner groups was 25 instead of 29 in the main test. None of the participants for the main study had previously taken part in the pilot study.

6.3.2. PROFICIENCY TEST

The results of the previous pilot study showed a correlation between learners' Cantonese proficiency and test scores but no association between other variables such as periods of learning and exposure to Cantonese-speaking environment and test scores. Therefore, L2 learners' proficiency in Cantonese was measured by a proficiency test carefully developed by the author drawing on Cantonese coursebook exercises by Tong and Gregory (1994), Chan and Hung (1994) and Lee (2000). In the proficiency test, learners were required to listen to recordings and answer questions on an answer sheet.[17] (See Appendix 9 for the full set of questions in the proficiency test). The test included three sub-sections of which examples are reported in (271 – 273). English translations are provided for each test item for convenience. However, these were not included in the actual proficiency test used with the participants. A total of 13 questions, incorporating 20 test items altogether, were included in this proficiency test.

[17] The proficiency test always preceded the experiment.

271. Section A) 5 questions of multiple choices at the vocabulary level

- Zou2san4 (Good morning)

  a. Good morning b. Good-bye

272. Section B) 5 questions of multiple choices at the sentence level (question and answer).

- Nei5giu3me1mang4aa3? (What is your name?)

  a. Ngo3sap6syui3. (I am ten year-old.)

  b. Ngo5giu3Mary. (I am Mary.)

273. Section C) 3 questions of fill-in-the-blank (all together 10 blanks) at the conversation level.

- Conversation I:

  Hawker: Hou2 leng3 saang1guo2. Maai5 di1 la1,siu2ze2.
  (Fresh fruits here. Miss, buy some please.)

  Carmen: Di1 mong1guo2 dim2 maai6 aa3?
  (How much is the mango?)

  Hawker: Di1 mong1guo2 ng3 man1 jat1 go3.
  (The mango is $5 each.)

  Carmen: Ngo3 jiu3 sei3 go3.
  (I would like to have four.)

  Hawker: Sei3 go3 mong1guo2, ji6-sap6 man1 la1.
  (Four mangoes, $20 please.)

  Carmen: Ni1dou6 ji6-sap6 man1.
  (Here is $20.)

  (a) What fruit did Carmen buy? ______________________

  (b) How many did she buy? _________________________

  (c) How much did she pay for them? __________________

Section A specifies tests vocabulary as exemplified in (271); section B tests comprehension of short sentences as exemplified in (272); and section C tests understanding of short conversations as exemplified in (273). All the test items were heard in the recordings and all of the questions were written on the answer sheet in Jyutping.[18] Since the whole study was designed to investigate learners' competence in their understanding of spoken Cantonese, participants were allowed to answer the questions in English in section C.

The final proficiency score was calculated via the number of correct answers out of 20. Since participants were required to understand spoken Cantonese very well to participate, they were expected to achieve at least 15 marks or 75% of the maximum 20. All participants of this test reached the 75% mark. By setting a minimum 75% passing mark, learners' good knowledge of the Jyutping system, which was used throughout the main study, was guaranteed. In addition, a 75% passing mark also guaranteed learners' understanding of spoken Cantonese in terms of vocabulary, short sentence comprehension and short conversation understanding. All L2 participants of the main study completed the proficiency test. The recording of the proficiency test started to play only when participants had understood instructions of all sections clearly and lasted 3 minutes 6 seconds. In practice, all participants finished the proficiency test within 5 minutes. Since the proficiency test was quite short and comparatively easy, learners were only allowed to make one mistake out of 20 in order to qualify for the advanced group.

6.3.3. OVERALL PROCEDURE

This section details only the overall procedure for collecting all the data needed and the specific details for each task, while the results will be reported in sections that follow. The main study consisted of three tasks: a GJT, a PJT and a CJT. In the preliminary studies (see Chapter 5), participants' performance got worse towards to the end of the test. Due to the test being too long, participants possibly lost focus and were not able to complete it. Even some NSs admitted that they lost focus towards the end. Hence, the main experiment took place in two sessions. Session one included the GJT and the PJT while session two included the CJT. Participants were told that completion of the two individual sessions should take approximately no more than 40 minutes each and that the two sessions should be completed on two separate days.

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[18] Jyutping is Cantonese phonetic transcriptions with tone markings. There are altogether 6 tone marks and they are indicated at the end of syllables. For more information, refer to http://www.lshk.org/node/47.

The approximate times allotted for each task, for both NS and L2 learner participants, are listed in (274).

274. Approximate time allotted for tasks as a guideline to participants:
  Session 1 Task 1 – GJT: 15-20 minutes
  Session 1 Task 2 – PJT: 15-20 minutes
  Session 2 Task 3 – CJT: 35-40 minutes

All three tasks were self-paced which meant participants were able to finish the tasks comfortably, without rushing. Although the Cantonese proficiency test was given separately, L2 learner participants were allowed to complete session one on the same day and they were advised to complete the proficiency test before session one.

The data collection was lengthy which amounted to a necessity for some participants to complete the experiment on their own, except in the cases where a few natives took part in the two tests in small groups. The experiment was administered by the author except for the 27 English-speaking learners of Cantonese, whose experiments were administered by the owner and instructor of the private Cantonese teaching institute where participants were recruited. Not all the tests were conducted in classrooms, but at venues convenient to the participants, including but not limited to quiet corners in cafes, study areas in university libraries, and participants' homes. Each venue had comfortable seats, good lighting, was quiet, and conductive to keeping outsider-distractions to a minimum. Participants were asked to take the test in front of a portable laptop, which is well equipped with audio-visual functions, using a PowerPoint presentation. Headsets were given if the participants required them. Before each task began, instructions were presented aurally in Cantonese as well as in writing in English on the answer sheets under each section. Instructions were also presented in Cantonese by the author to the native control when required. All test items were presented visually on the screen, written in Cantonese Chinese and in participants' familiar Jyutping, and aurally twice in each slide. For each task, there was one example to illustrate the mechanics of the task looked and how should participants select the correct answers. Each slide presented one test item at a time. Participants were asked to press the ENTER key and move on to the next slide at their own pace. The audio files were automatically played along with each test item. Participants were allowed to repeat the audio presentation more than once if necessary.

6.4. FINDINGS: GRAMMATICALITY JUDGEMENT TASK (GJT)

This section includes results from 56 natives, 30 intermediate and 25 advanced L2 leaners. There were altogether 36 items in the GJT, which includes 24 experimental items and 12 control items. For the analysis, it was decided that data from participants who chose 'Can't decide' or left a blank answer on more than three experimental items (>10% of the 24 tokens) were to be excluded. In addition, data from those participants who chose 'Can't decide' or gave a blank answer more than one of the control items (>10% of the 12 tokens), was also excluded from the analysis. Table 24 summarises the number of participants whose data was excluded for the main analysis. The resulting size of each group was: 46 control natives, 28 intermediate and 21 advanced L2 learners.

Table 24. Main Study – Number of participants' data excluded by choosing 'Can't decide' or blank answer >1 control items and >3 experimental items in the GJT

Group	Control items (n=12)		Experimental items (n=24)		Total no. of participants excluded
	No. of participants excluded	Maximum no. of 'Can't decide' / blank answer by individual	No. of participants excluded	Maximum no. of 'Can't decide' / blank answer by individual	
Int (n=30)	2	3	0	0	2
Adv (n=25)	1	3	3	7	3
NS (n=56)	6	4	4	5	10

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; Total number of 'Can't decide' in percentage by NS is 3%, by Int is 2%, and by Adv is 4%; Total number of blank answer in percentage by NS is 0%, by Int is 1%, and by Adv is 0%.

For the analysis, two measures were calculated: mean ratings and accuracy scores. The rating scale of '-2', '-1', '+1' and '+2' was replaced by '0', '1', '2' and '3' respectively for the mean rating analysis using Excel coding. For example, a rating score coded '0' for analysis represents selection of '-2' on the actual scale. Mean ratings were calculated by dividing the sum of scores on a particular sentence type by the number of tokens of the type. Therefore in the analysis, a mean rating of below 1.5 indicates a negative score of or rejection ('-1' or '-2') to the test type, and a mean rating of above 1.5 indicates a positive score of or acceptance ('+1' or '+2') to the test type. Since the original scale is not an even scale as the difference between '-1' and '+1' is 2, whereas the difference between '-2' and '-1' and between '+1' and '+2' is 1, the transformation took place in order to avoid scores being cancelled out in selections of both negative and positive scores of the test type. Responses of 'Can't decide' or blank answers were excluded from the main analysis. Accuracy scores, on the other hand, were calculated by dividing the number of positive scores by the total number of grammatical items and by dividing the number of negative scores by the total number of ungrammatical items of each sentence type. It represented the percentage of accurate positive ratings for the grammatical items, and the percentage of accurate negative ratings for the ungrammatical ones. Findings were computed and analyzed using the statistics package SPSS.

6.4.1. CONTROL SENTENCES

Results from the control items were used to double-check the reliability of the test and to determine whether any of the participants' data should be excluded due to low accuracy on these items. Twelve control sentences were included, involving grammatical SVO versus ungrammatical SOV order with referential NPs (e.g. this book) and grammatical SOV versus ungrammatical SVO order with NegQs (e.g. *moujan* 'nobody'). The twelfth control items are exemplified in Table 25.

Table 25. Main Study – Control sentence types in the GJT

Type	Word Order	Object Type	Examples	No. of items
C_{NP}.G		Referential NP	Winnie tai-guo yi-bun sju.	3
	SVO		Winnie read-ASP this-CL book	
C_{NegQ}.B		Ordinary NegQ	Margret hui-guo mou-deifong.	3
			Margret go-ASP nowhere	
C_{NP}.B		Referential NP	James cin zungji.	3
	SOV		James money like	
C_{NegQ}.G		Ordinary NegQ	Matthew mou-je sik-guo.	3
			Matthew nothing eat-ASP	

Note. ASP = aspectual marker; NP = standard noun phrases; NegQ = negative quantifiers; C_{NP} = controls with referential NP; C_{NegQ} = controls with ordinary NegQ; G = grammatical sentences; B = ungrammatical sentences.

For the test to be valid, NSs were expected to be highly accurate by scoring at or above 83% (at least 10 out of 12).[19] The results shown in Table 26 suggest validity of the GJT from the NS group perspective.

Table 26. Main Study – Mean rating and accuracy rates for controls in the GJT

Group	Mean [SD]		Accuracy	
	Grammatical	Ungrammatical	Grammatical	Ungrammatical
Int (n=28)	2.26 [0.35]	0.76 [0.31]	87%	88%
Adv (n=21)	2.34 [0.44]	0.79 [0.58]	69%	76%
NS (n=46)	2.51 [0.35]	0.40 [0.43]	89%	92%

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

[19] Note that, 100% accuracy is not expected even from NSs because they have different acceptance rates to different colloquial forms of Cantonese. According to Tong and James (1994), Cantonese "is the only variety of Chinese (besides Mandarin) with widely recognized non-traditional written characters for such colloquial words and expressions" and "remains essentially a spoken language, with no universally recognized written form." (Tong and James, 1994, p.2) Since written forms of Cantonese were also used throughout the study, there is a chance that even the NSs were giving incorrect judgements due to their dispreference for the written form of colloquial terms. Finally, even results from the pilot test confirm that 100% accuracy by NSs is rare (see Chapter 5).

All groups assigned grammatical sentences a mean rating of above 1.5 while ungrammatical sentences were below 1.5. This indicates that all groups largely rated positive scores to grammatical sentences but negative ones to ungrammatical sentences. In terms of accuracy rates, the native controls show an 89% accuracy rate for grammatical sentences and a 92% accuracy rate for ungrammatical ones, which warrants the methodology used. The results confirm both learner groups understood Cantonese grammar well. The advanced learners had lower accuracy rates on both grammatical and ungrammatical sentences compared to the intermediate learners. This is a result of advanced learners having an overall poorer performance on sentences with NegQs than those with NPs. The item analysis of the control items with referential NPs is displayed in Table 27.

Table 27. Item analysis of control items with referential NP in the GJT

Item	Int (n=28) mean [SD] (Acc)	Adv (n=21) mean [SD] (Acc)	NS (n=46) mean [SD] (Acc)
C_{NP}G01	2.5 [0.51] (100%)	2.38 [0.92] (90%)	2.67 [0.67] (93%)
C_{NP}G03	2.29 [0.76] (89%)	2.86 [0.36] (100%)	2.93 [0.44] (98%)
C_{NP}G06	2.61 [0.50] (100%)	2.14 [1.01] (76%)	2.87 [0.34] (100%)
C_{NP}G-Mean	2.46 [0.34](96%)	2.46 [0.54] (89%)	2.83 [0.34] (97%)
C_{NP}B01	0.71 [0.66] (86%)	0.67 [0.86] (86%)	0.37 [0.61] (93%)
C_{NP}B04	0.93 [0.77] (82%)	0.62 [0.67] (90%)	0.54 [0.89] (83%)
C_{NP}B06	0.79 [0.63] (89%)	0.81 [0.87] (81%)	0.52 [0.84] (87%)
C_{NP}B-Mean	0.81 [0.48] (86%)	0.70 [0.61] (86%)	0.48 [0.51] (88%)
Overall Mean	91%	87%	92%

Note. Acc = accuracy; C_{NP} = controls with referential NP; G = grammatical SVO sentences; B = ungrammatical SOV sentences; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Control items with a mean NS rating between 1 and 2 and a standard deviation [SD] greater than 1 were considered potentially unreliable. None of the items, however, fall into this category. Table 27 shows the accuracy rates for all groups are high and range from 87 to 92% and suggests L2 learners were aware of the grammaticality of canonical SVO word order in Cantonese. However, a surprisingly low accuracy rate from advanced learners is found for controls with ordinary NegQs as shown in Table 28.

Table 28. Item analysis of control items with ordinary NegQ in the GJT

Item	Int (n=28) mean [SD] (Acc)	Adv (n=21) mean [SD] (Acc)	NS (n=46) mean [SD] (Acc)
C_{NegQ}G02	1.64 [1.03] (61%)	1.62 [1.07] (48%)	2.24 [0.77] (85%)
C_{NegQ}G04	2.29 [0.71] (86%)	1.90 [1.09] (57%)	2.72 [0.66] (93%)
C_{NegQ}G05	2.25 [0.80] (856%)	1.62 [1.02] (43%)	1.70 [0.80] (65%)
C_{NegQ}G-Mean	2.10 [0.53] (77%)	1.71 [0.78] (49%)	2.20 [0.51] (81%)
C_{NegQ}B02	0.68 [0.67] (89%)	0.76 [1.09] (71%)	0.24 [0.57] (98%)
C_{NegQ}B03	0.79 [0.74] (86%)	0.95 [0.92] (62%)	0.33 [0.60] (98%)
C_{NegQ}B05	0.68 [0.72] (93%)	0.95 [1.07] (67%)	0.41 [0.69] (93%)
C_{NegQ}B-Mean	0.71 [0.36] (89%)	0.89 [0.86] (67%)	0.33 [0.47] (96%)
Overall Mean	88%	58%	89%

Note. C_{NegQ} = controls with ordinary NegQ; G = grammatical SOV sentences; B = ungrammatical SVO sentences; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Even though accuracy rates for all groups decreased in controls of this type compared to referential NPs, none of the sentence control items fall into the potentially unreliable score range. All groups were more accurate in rejecting the incorrect SVO order than accepting the correct SOV order of the NegQ type. One unexpected result has to do with the intermediate learners who obtained 77% accuracy on grammatical control items and 89% accuracy on ungrammatical control items, while the advanced learners fell behind with scores of 49% accuracy on grammatical control items and 67% accuracy on ungrammatical control items. Advanced learners' accuracy rate for accepting the correct SOV order of NegQ was only 49% and rejecting the incorrect

SVO order of it was only 67%. All groups, in particular the learner groups, were in general less consistent in accepting the SOV order and rejecting the SVO order of NegQ types.

A repeated measures ANOVA with word order (grammaticality versus ungrammaticality), object type (NP versus NegQ) as independent variables and group as the dependent, indicated a main effect of word order ($F_{1,92} = 479.993$, $p = .000$, partial eta-squared = .839, power = 1.000), and object type ($F_{1,92} = 50.040$, $p = .000$, partial eta-squared = .352, power = 1.000), as well as a significant interaction of word order and group ($F_{2,92} = 12.635$, $p = .000$, partial eta-squared = .215, power = .996) and of word order and objet type ($F_{1,92} = 34.741$, $p = .000$, partial eta-squared = .274, power = 1.000), but no three-way interaction of word order, object type and group (see Appendix 13.2). In summary, all groups were accurate on control items with referential NPs but only NSs and intermediate learners were accurate on control items with NegQs. The advanced learners, however, were least accurate in control items with NegQs (58% in average), which suggests that advanced learners' inaccuracy was possibly due to failure in acquiring the correct SOV word order of $NegQ_{obj}$. Variability of responses with the NegQ control items by the advanced L2 group may be due to the finiteness variables.[20] This hypothesis will be checked against the accuracy on experimental items involving finiteness to be reported in the next section.

6.4.2. EXPERIMENTAL ITEMS

Turning to the results of the experimental items, mean ratings and accuracy rates for each item for each group were calculated. The purpose of item analysis was to exclude problematic items from main analysis. Twenty-four experimental items with Neg-whQs are exemplified in Table 29.

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[20] The limitation lies in the imbalance number of tokens with finite verbs and nonfinite verbs, surprising results could be assimilated as possible effect of the verb finiteness. Apart from item C_{NegQ}G04, all other control items with NegQs involve the use of an aspect marker on the verbs. C_{NegQ}B05 involves the aspectual marker –zo and the rest involve the aspectual marker –guo (see Appendix 11 for more details). Cheng et al. (1996) suggested that *mou* as a negator can only be used with various aspects and cannot be used with the perfective aspectual marker *–zo*. Although C_{NegQ}B05 was designed with the aspectual marker –zo mistakenly, the SVO order with a $NegQ_{obj}$ is any how ungrammatical. This should not mislead participants in incorrectly judging this item as grammatical, if learners have noticed SOV order as the correct word order of $NegQ_{obj}$ constructions.

Table 29: Experimental sentence types in the GJT

Type	Word Order	Finiteness	Examples	No. of items
Fin.G	Grammatical SOV	Finite verbs	Peter mou-matje sik-zo. Peter no-what eat-ASP a. 'Peter ate nothing.' b. 'Peter ate only a few things.'	6
NonFin.G		Nonfinite verbs	Antony mou-bindou soeng hui. Antony no-where want-to go a. 'Antony wants to go to nowhere.' b. 'Antony wants to go to only a few places.'	6
Fin.B	Un-grammatical SVO	Finite verbs	*Matthew sik-zo mou-matje. Matthew eat-ASP no-what	6
NonFin.B		Nonfinite verbs	*Antony soeng hui mou-bindou. Antony want-to go no-where	6

Note. G = grammatical sentences; B = ungrammatical sentences; Fin = finite; NonFin = non-finite; ASP = aspectual marker; Finite verb = verbs with aspectual markers.

There were types of sentences balanced for number of tokens. Among the 24 experimental items, there were six tokens for grammatical sentences with finite verbs (Fin.G), six for grammatical sentences with non-finite verbs (NonFin.G), six for ungrammatical sentences with finite verbs (Fin.B) and six for ungrammatical sentences with non-finite verbs (NonFin.B).

The mean rating and standard deviation of individual items testing Neg-whQs with finite verbs are presented in Table 30 while those with nonfinite verbs are presented in Table 31.

Table 30. Mean rating and standard deviation (SD) of individual experimental items with finite verbs.

	Fin.G 01	Fin.G 02	*Fin.G 03	Fin.G 04	Fin.G 05	Fin.G 06	Fin.B 01	Fin.B 02	Fin.B 03	Fin.B 04	Fin.B 05	*Fin.B 06
Int	1.57	1.57	1.29	1.43	1.57	1.32	0.64	1.39	0.89	1.00	0.96	1.61
(n=28)	(0.88)	(0.92)	(1.01)	(0.88)	(0.96)	(0.90)	(0.62)	(0.99)	(0.74)	(0.94)	(0.88)	(1.07)
Adv	1.86	1.90	1.38	1.48	1.33	1.43	0.90	1.52	0.57	0.95	0.62	1.29
(n=21)	(0.91)	(1.09)	(1.02)	(1.08)	(1.06)	(1.08)	(0.94)	(1.08)	(0.87)	(1.07)	(0.82)	(1.01)
NS	1.9	2.24	1.37	1.65	1.74	1.78	0.52	0.89	0.35	0.37	0.24	1.65
(n=46)	(0.91)	(0.87)	(0.90)	(0.92)	(0.95)	(0.87)	(0.72)	(1.12)	(0.64)	(0.61)	(0.67)	(0.90)

Note. Fin.G = sentence types with finite verbs and grammatical SOV order; Fin.B = sentence types with finite verbs and ungrammatical SOV order; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; * Excluded problematic sentence.

Table 31. Mean rating and standard deviation (SD) of individual experimental items with nonfinite verbs.

	NonF. G01	NonF .G02	NonF .G03	NonF .G04	NonF .G05	*NonF. G06	NonF .B01	NonF .B02	NonF .B03	NonF .B04	NonF .B05	NonF .B06
Int	1.54	1.75	1.75	1.61	1.46	0.89	1.50	1.29	1.14	1.50	1.25	1.32
(n=28)	(1.04)	(0.89)	(0.59)	(1.23)	(0.88)	(0.74)	(1.00)	(0.85)	(0.85)	(0.88)	(0.80)	(0.86)
Adv	1.95	2.10	1.76	2.14	1.48	1.38	1.14	0.76	0.67	0.95	0.76	0.71
(n=21)	(1.07)	(1.09)	(1.18)	(1.11)	(0.93)	(1.07)	(0.96)	(0.94)	(0.73)	(1.11)	(0.83)	(0.90)
NS	2.78	2.39	2.26	2.87	1.91	1.15	0.54	0.33	0.41	0.33	0.26	0.30
(n=46)	(0.55)	(0.65)	(0.88)	(0.50)	(0.86)	(0.73)	(0.62)	(0.63)	(0.72)	(0.56)	(0.61)	(0.66)

Note. NonF.G = Type NonFin.G, sentence types with nonfinite verbs and grammatical SOV order; NonF.B = Type NonFin.B, sentence types with nonfinite verbs and ungrammatical SOV order; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; *Excluded problematic sentence types.

Experimental items with a mean rating between 1 ('-1') and 2 ('+1') and a standard deviation greater than 1 by NSs were considered to be potentially unreliable. None of the experimental items with finite or nonfinite verbs fall into this category. However, three experimental items, Fin.G03, Fin.B06 and NonFin.G06 were excluded from the main analysis because NSs rated experimental items with a mean score above 1.5 from ungrammatical sentences and below 1.5 from grammatical sentences. Since a mean rating of below 1.5 indicates rejection and a mean rating of above 1.5 indicates an acceptance of the test item, mean ratings below 1.5 from Fin.G03 and NonFin.G06 and above 1.5 from Fin.B06 by NSs were problematic. Another reason for excluding these items is related to mistaken use SP associating with the aspectual marker *–zo*.

275. Fin.G03:

Peter	*mou-matje*	sik-zo
Peter	no-what	eat-ASP

Item Fin.G03 in (275) was the only experimental item of the grammatical type with a finite verb ending in a *–zo* suffix but no SP. Perhaps the fact the NS results were contrary to prediction is due to the oddness of the*–zo* suffix, which tends to presuppose an existential reading. As discussed in Cheng et al.'s (1996) and in footnotes 15 and 21, the negator *mou* cannot be used with the aspectual marker *–zo.* In Chapter 3 it was also argued that the *–zo* verb suffix can only be used when the raised Neg-whQ_{obj} is interpreted as existential 'only a few' in the presence of a SP with [+p] feature. Thus, low accuracy scores on this item are possibly due to the absence of a SP in this case. Comparing Fin.G03 to Fin.G06 further supports this hypothesis. Item Fin.G06 which includes a *–zo* suffix and the $SP_{[+P]}$ *–ze* was unproblematic.

276. Fin.B06:

Bonnie	zinglaan-zo	*mou-matje*	ze
Bonnie	break-PFV	no-what	SP

Next, item Fin.B06 above was the only ungrammatical sentences with an SP.[21] Item Fin.B06 in (276) could possibly sound grammatical in spoken Cantonese if *mou-matje* and the final SP *ze* are perceived as a right dislocation construction as a result of scrambling.

277. NonFin.G06:

Thomas	*mou-bindou*	gaiwaak	hui
Thomas	no-where	plan	go

The source of incorrect rejection of the grammaticality of NonFin.G06 is unclear. It could possibly be due to the phonetic constraints with the sequence of words *mou-bindou gaiwaak hui* comparing to a more commonly used construction *Thomas mou gaiwaak hui bingou* ('Thomas doesn't plan to go anywhere') in Cantonese. Therefore, responses of these three items from all groups were excluded.

Mean rating and accuracy rates by group are discussed separately.[22]

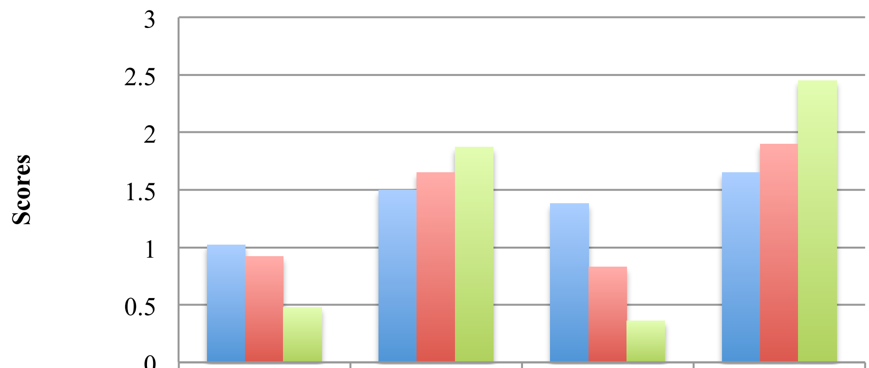
[21] Note that scrambling is common in Cantonese. Noun phrases are often scrambled to sentential position (left-most) position or sentential final (right-most) position with an SP, as Focus or Topic.

[22] Table i. Main Study – Number of 'Can't decide' and blank answer in experimental items (GJT) by L2 groups

Group	Number of selection: 'Can't decide'	Number of selection: Blank answer	Total possibility[a]
Int (n=28)	9 (1%)	8 (1%)	672
Adv (n=21)	6 (1%)	0 (0%)	504

Note. [a]'Total possibility' = No. of participants x No. of experimental items in the GJT (24 items); Int = intermediate; Adv = advanced.

Figure 5. Mean rating of experimental items by type in the GJT



	Fin.B	Fin.G	NonFin.B	NonFin.G
Int (n=28)	1.02	1.5	1.38	1.65
Adv (n=21)	0.92	1.65	0.83	1.9
NS (n=46)	0.48	1.87	0.36	2.45

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Figure 5 reflects an effect of word order and finiteness. Mean scores on grammatical SOV types are all ≥1.5 and range from 1.5 to 2.45, whereas the mean scores on ungrammatical SVO types are all <1.5 and range from 0.36 to 1.38 for all groups. The results indicate all groups correctly accepted the grammatical SOV order and rejected the ungrammatical SVO order in Neg-whQ_{obj} constructions. In ungrammatical type sentences (Fin.B and NonFin.B), NSs consistently rated the lowest mean scores, 0.48 and 0.36 respectively. In contrast, the intermediate L2 learners consistently rated the highest mean scores, 1.02 and 1.38 respectively on ungrammatical type sentences while the advanced L2 learners' mean scores are in between those of the native and intermediate learner groups. In grammatical type sentences (Fin.G and NonFin.G), NSs consistently rated the highest mean scores, 1.87 and 2.45 respectively. In contrast, the intermediate L2 learners consistently rated the lowest scores, 1.5 and 1.65 respectively on the same items while the advanced L2 learners' mean scores are in between those of the other two groups. This suggests a developmental trend towards native-like from intermediate to advanced group.

A repeated measures ANOVA with finiteness and word order as independent variables and group as dependent shows a strong main effect of finiteness ($F_{(1,92)}$ = 25.287, p = .000, partial eta-squared = .216, power = .999) and word order ($F_{(1,92)}$ = 116.187, p = .000, partial eta-squared = .558, power = 1.00), no main effect of group, a highly significant interaction of word order and group ($F_{(2,92)}$ = 22.772, p = .000, partial eta-squared = .331, power = 1.00), but no interaction of finiteness and group ($F_{(2,92)}$ = 1.619, p = . 204, partial eta-squared = .034, power = .334), and the three-way interaction of independent variables word order, finiteness and group is highly statistical ($F_{(2,92)}$ = 14.611, p = . 000, partial eta-squared= .241, power = .999) (see Table 13.3.C in Appendix 13.3 for all results of the analysis). The effect of finiteness is reflected in the performances of NSs and advanced L2 learners. There is an increase in their mean ratings on ungrammatical sentences and a decrease in their mean ratings on grammatical sentences, from nonfinite to finite sentences.

A multivariate ANOVA was also run to compare mean scores of all three groups, with Fin.G, Fin.B, NonFin.G and NonFin.B as dependent variables (see Table 13.3.F in Appendix 13.3). For mean scores of Fin.B and Fin.G types, the Games-Howell post hoc test indicates a significant difference between the NSs and the intermediate L2 group ($p < .05$) but no difference between the native and the advanced L2 group, and between the two L2 groups. For mean scores of NonFin.B and NonFin.G types, the Games-Howell post hoc test indicates significant differences between the native and both L2 groups ($p < .05$). This suggests neither the intermediate nor the advanced L2 learners made native-like judgement in rejecting the ungrammatical SVO and accepting the grammatical SOV order on nonfinite sentences. However the significant difference is only found between the intermediate and advanced groups on mean scores of NonFin.B but not NonFin.G items. Since the statistical probability that the advanced L2 learners and NS scores (p = .044 and .020 on NonFin.B and NonFin.G respectively) were different was larger than the probability the intermediate L2 learners and the NSs were (p = .000 on both NonFin.B and NonFin.G), the advanced L2 group is likely to be more accurate and more similar to the NSs in rejecting the ungrammatical SVO word order and accepting the grammatical SOV word order of Neg-whQ_{obj} constructions with nonfinite verbs. Table 32 summarises the main significant differences highlighted above.

Table 32: Significant difference between NSs and the two learner groups on mean scores by sentence types in the GJT

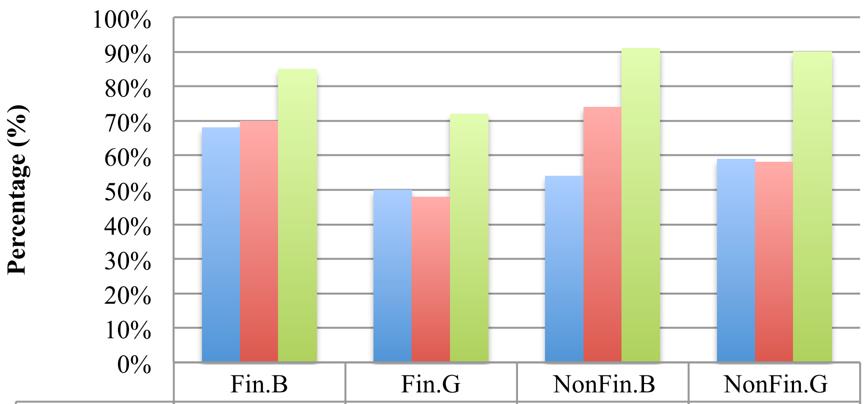
	Group contrasts		
Sentence Type	Intermediate L2 versus Advanced L2	Intermediate L2 versus NSs	Advanced L2 versus NSs
Fin.B		✓	
Fin.G		✓	
NonFin.B	✓	✓	✓
NonFin.G		✓	✓

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; ✓ = significant difference.

In general, there is a significant difference between the NS group and both L2 groups in their performances on NonFin.B and NonFin.G sentences. The L2 groups' do not differ from each other significantly in accepting the grammatical SOV sentences but differed from each other on rejection of the ungrammatical SVO sentences with finite verbs. These results suggest the advanced learners were more accurate in rejecting the ungrammatical SVO sentences than the intermediate learners on nonfinite types. Finally, the significant difference observed only between NSs and intermediate L2 learners on finite sentences suggests the advanced L2 learners were more native-like than the intermediate learners.

We now turn to the discussion of accuracy rates, in percentage, by all groups, displayed in Figure 6.

Figure 6. Accuracy rates for experimental items by type in the GJT



	Fin.B	Fin.G	NonFin.B	NonFin.G
Int (n=28)	68%	50%	54%	59%
Adv (n=21)	70%	48%	74%	58%
NS (n=46)	85%	72%	91%	90%

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

The accuracy rate enables us to gauge the consistency by all groups to assign positive scores to grammatical sentences but negative ones to ungrammatical sentences. All groups show a higher accuracy rate in rejecting the ungrammatical SVO order than accepting the grammatical SOV order with Neg-whQ constructions, except the intermediate L2 learner group in nonfinite sentences, with grammatical SOV and ungrammatical SVO order (where there is a reverse case). The native group obtained the highest accuracy rates on all types of sentences with and their accuracy rates ranging from 72 to 91%. NSs generally showed higher consistency on NonFin sentence type than Fin sentence type and performed better in rejecting the ungrammatical SVO than in accepting the grammatical SOV word order. Responses from the advanced learners show the same pattern as the controls. The advanced learners were consistently more accurate in rejecting the ungrammatical SVO order than the intermediate learners, regardless of finiteness of the verbs. On sentence types with ungrammatical SVO order, the advanced learners obtained a 70% accuracy rate on Fin items and a 74% accuracy rate on NonFin items while the intermediate obtained a 68% accuracy rate on Fin items and a 54% accuracy rate on NonFin items. On the other hand, the advanced learners were less accurate in accepting the grammatical SOV sentences than the intermediate learners, regardless of finiteness of the verbs. On sentence types with grammatical SOV order, the advanced learners obtained a 48% accuracy rate on Fin items and a 58% accuracy rate on NonFin items, while the intermediate learners obtained a 50% accuracy rate on Fin items and a 59% accuracy rate on NonFin items.

A repeated measures ANOVA with finiteness and word order as independent variables, and group as the dependent shows a main effect of group ($F_{(2,92)}$ = 18.332, p = .000, partial eta-squared = .285, power = 1.000), finiteness ($F_{(1,92)}$ = 7.132, p = .009, partial eta-squared = .072, power = .753) and word order ($F_{(1,92)}$ = 15.881, p = .000, partial eta-squared = .147, power = .976), an interaction of finiteness and group ($F_{(2,92)}$ = 5.594, p = .005, partial eta-squared = .108, power = .847) and of finiteness and word order ($F_{(1,92)}$ = 12.908, p = .001, partial eta-squared = .123, power = .945), but no interaction of word order and group ($F_{(1,92)}$ = 1.825, P = .167, partial eta-squared = .038, power = .372) (see Table 13.4.B in Appendix 13.4 for full results). A follow up Games-Howell post hoc test shows a significant difference between the control and L2 learner groups ($p < .05$) (see Table 13.4.D in Appendix 13.4 for full results). A multivariate ANOVA, with each sentence type as dependent variables, was run and the output of post hoc comparisons is summarized in Table 33 (see Table 13.4.E in Appendix 13.4 for full results).

Table 33: Significant difference between NSs and the two learner groups on accuracy rates by sentence types in the GJT

	Group contrast		
Sentence Type	Intermediate L2 versus Advanced L2	Intermediate L2 versus NSs	Advanced L2 versus NSs
Fin.B		✓	
Fin.G	✓	✓	✓
NonFin.B		✓	
NonFin.G	✓	✓	✓

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; ✓ = significant difference.

There is a significant difference between the two L2 groups as well as between the advanced L2 group and the control in accuracy rates for grammatical sentence types (Fin.G and NonFin.G), but not for ungrammatical sentence types (Fin.B and NonFin.B). The difference in accuracy rate between the intermediate and advanced L2 groups for NonFin.B items nears significance (Games-Howell post hoc test, $p = .086$). While there is a significant difference ($p < .05$) between the intermediate group and the control in accuracy rates for all sentence types, the significant difference between the advanced group and the control is only found in accuracy rates for Fin.G and NonFin.G items.

To summarise, it was found that all groups had mean scores below 1.5 for ungrammatical SVO types which indicates target-like rejection of incorrect SVO word order of Neg-whQ$_{obj}$ constructions, while mean scores above 1.5 for grammatical SOV types indicates target-like acceptance of grammatical SOV word order with Neg-whQ$_{obj}$ constructions. L2 learners were in general more accurate in rejecting the ungrammatical word order than accepting the grammatical word order. Apart from the intermediate L2 learners who tend to reject the ungrammatical SVO order, all groups were in general more accurate in NonFin items than Fin items. Results suggest that the finiteness of the verbs correlates to participants' accuracy, as statistics show the main effect of finiteness and as interaction of finiteness and group.

6.4.3. DISCUSSION

The GJT was designed to look into how successful L2 learners were in rejecting the ungrammatical SVO and accepting the grammatical SOV order of Neg-whQ$_{obj}$ constructions. In this way, the thesis tested Slabakova's (2006, 2008, 2010) Bottleneck Hypothesis and FA of Schwartz and Sprouse (1996). Given the absence of a one-to-one morphological mapping of Neg-whQs and the absence of corresponding obligatory overt movement of the Neg-whQ$_{obj}$ from the L2 learners' L1 English grammar to L2 Cantonese, it was predicted that English-speaking L2 learners with lower Cantonese proficiency would fail to acquire the correct word order of Neg-whQ$_{obj}$ constructions in Cantonese. The SOV word order is a result of an overt raising of the Neg-whQ$_{obj}$ from its base object position to a preverbal position. If L2 learners at advanced levels also failed to acquire the correct word order of Neg-whQ$_{obj}$ constructions, this would suggest that the lack of one-to-one morphological mapping leads to learning difficulty and support Slabakova's claim. However, FT suggests that learners' L1 grammar affects the possibility of L2 movement over a finite verb even if the correct order is gradually acquired. As discussed in Chapter 5, this is due to the L2 learners' inability to associate an existential reading with Neg-whQs and disallow the co-occurrence of the negative morpheme *mou* and other aspectual markers. However, advanced L2 learners were predicted to attain native-like knowledge of obligatory overt raising of a Neg-whQ_{obj} in sentences with both finite and nonfinite verbs. If L2 learners master the correct word order, this would support FA. The hypothesis related to the word order of Neg-whQs is repeated in (278).

278. Word order of Neg-whQs:
    - HYPOTHESIS 1: Intermediate learners will correctly accept the SOV order of a Neg-whQ_{obj} construction with nonfinite verbs and incorrectly reject those with finite verbs, whereas advanced learners will correctly accept the correct SOV order and reject the incorrect SVO order regardless of finiteness.

The results from the GJT confirm the prediction that the grammatical SOV order of a Neg-whQ_{obj} construction can be mastered by advanced L2 Cantonese learners. L2 participants were in general more accurate in rejecting the ungrammatical SVO order of Neg-whQ_{obj} constructions than accepting the grammatical SOV order of Neg-whQ_{obj} constructions. The SVO word order is the canonical word order in English and Cantonese, however, the grammatical word order of a Neg-whQ_{obj} construction is SOV. Therefore, successful rejection of SVO order in these constructions indicates learners' ability to obtain such knowledge. The learners appear to be transitioning from an L1 grammar, where there is no movement of a Neg-whQ_{obj}, to an interlanguage/L2 grammar where there is obligatory overt movement of a Neg-whQ_{obj} to preverbal position which results in SOV. This was demonstrated by L2 learners' consistent positive mean rating ≥1.5 for grammatical SOV sentences and negative mean ratings below 1.5 for ungrammatical SVO sentences, regardless of learners' variables such as proficiency and linguistic variables such as finiteness.

Hypothesis 1, that intermediate learners will incorrectly reject the SOV order of Neg-whQ_{obj} constructions with finite verbs whereas advanced learners will accept this correct order, is partially confirmed. Both groups showed fairly low accuracy in accepting grammatical SOV sentence types, contra the prediction on the advanced learner group in Hypothesis 1. However, both groups were more accurate in rejecting the ungrammatical SVO word order than accepting the grammatical SOV word order. These results suggest that learners had not fully acquired the grammatical SOV word order as they rejected the target-like SOV structure up to the rate 50%. Statistical analysis revealed there was a significant difference between NSs and both L2 groups' positive ratings of grammatical sentences (Fin.G and NonFin.G). However, such difference was also found between the intermediate and advanced L2 groups. Advanced L2 learners were less accurate in accepting the grammatical SOV word order compared to the intermediate L2 learners. This echoes with their low accuracy rate 49% in accepting SOV order of $NegQ_{obj}$ constructions in the control items, compared to the 77% accuracy rate of the intermediate L2 group. This finding is likely to be the result of variability in individual preferences; thus, individual results are in need of discussion. In terms of rejecting the ungrammatical SVO order, an improvement from intermediate to advanced L2 proficiency levels was found. The accuracy rates in rejecting ungrammatical SVO order by intermediate L2 group ranged from 54 to 68%, and there is a decrease in accuracy from Fin type to NonFin type. In contrast, the advanced L2 group ranged from 70% to 74%, with a significant improvement from Fin type to NonFin type. Statistical analysis showed a significant difference between NSs and intermediate L2 learners in accurate rejection of the ungrammatical order, although no significant difference was found between NSs and advanced L2 group. The results suggested that the advanced L2 learners were more accurate than the intermediate L2 learners in rejecting the ungrammatical SVO word order, while both L2 groups did not show consistency in accepting the grammatical SOV word order of Neg-whQ_{obj} constructions. In fact, 10 out of 28 intermediate learners obtained an overall accuracy mean of below 50% on all experimental types suggesting strong variability in their judgement of Neg-whQ_{obj} constructions. In addition, significant differences between the mean accuracy rates of the NSs and the intermediate L2 group for all types of sentences were found.

Statistical analysis on accuracy rates reported a main effect of finiteness ($p = .009$). In addition, the interaction of finiteness and group ($p = .005$) and finiteness and word order ($p = .001$) were also statistically significant. The significant interaction of the finiteness and group indicates real differences among the three participant groups in their judgement of Neg-whQ_{obj} constructions depending on the finiteness of the verb. In terms of the L2 learners' responses to grammatical SOV sentences, both groups in general failed to attain native-like levels of acceptance, their accuracy rate ranging from 48 to 59%. This was reflected by the responses from both L2 groups to the grammatical SOV word order being only a 50:50 chance of accuracy, and both groups performing significantly differently from the NS group in accepting the grammatical SOV word order. These results provide evidence that Neg-whQ is a 'bottleneck' and that complex morphology causes learning difficulty even at advanced L2 stages.

Nonetheless, advanced L2 learners were more likely to show native-like judgement than the intermediate group. Regarding their mean ratings on grammatical sentences, intermediate learners scored on average 1.5 on finite sentences and 1.65 on nonfinite sentences whereas the advanced learners scored on average 1.65 on finite sentences and 1.9 on nonfinite sentences. Although both L2 groups assigned a higher positive mean rating for nonfinite than finite type sentences, the advanced L2 learners consistently assigned higher mean ratings to both finite and nonfinite sentence types than the intermediate group. Higher mean ratings suggests a greater tendency to select larger positive rates out of the two options '+1' and '+2'. Although, the results suggest L2 knowledge of obligatory movement gradually emerges with higher proficiency as a result of continuous exposure to L2 input.

Regarding the ungrammatical sentences, L2 groups were more accurate in disallowing the ungrammatical SVO order and showed higher accuracy rate on ungrammatical sentences than the grammatical ones. Advanced L2 learners, however, consistently obtained higher accuracy rates than the intermediate learners. While the intermediate group obtained 54% accuracy on nonfinite sentence type, the advanced group obtained 74%. While the intermediate group obtained 68% on finite sentence type, the advanced group obtained 70%. Statistical analysis did not show a significant difference between NSs and advanced L2 learners though. A significant difference was found between NSs and the intermediate learners. It is evident that advanced L2 learners showed native-like rejection of the ungrammatical SVO order, regardless of finiteness, which indicates the second half of Hypothesis 1 is confirmed. The effect of finiteness is also proved by learners' mean ratings on both finite sentence types (Fin.B and Fin.G). While statistical analysis show a significant difference between NSs and intermediate learners on these two sentence types, no difference is found between the control and the advanced L2 group. Overall these results suggest a general development trend for the effect of finiteness.

Only a small number of results, mainly from the individual data, support the claim that UG is fully accessible. Table 34 shows the number of individual participants demonstrating consistent accuracy, that is individual's accuracy in rating positive scores on all grammatical tokens and rating negative scores on all ungrammatical tokens of each type, in all experimental items.

Table 34. Main Study – Number (%) of individuals demonstrating consistent accuracy on nonfinite and finite sentence types in the GJT

	Finite			Nonfinite			Both Types
	Consistent rejection on SVO	Consistent acceptance on SOV	100% accuracy	Consistent rejection on SVO	Consistent acceptance on SOV	100% accuracy	
Int (n = 28)	4 (14%)	2 (7%)	0 (0%)	2 (7%)	8 (29%)	2 (7%)	0 (0%)
Adv (n = 21)	8 (38%)	2 (10%)	2 (10%)	11 (52%)	6 (29%)	5 (24%)	1 (5%)
NS (n = 46)	22 (48%)	21 (46%)	9 (20%)	32 (70%)	29 (63%)	19 (41%)	4 (9%)

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

As expected, NSs obtained the highest consistently accuracy on all types of sentences among all groups and were generally more consistent with nonfinite (41%) than finite sentence types (20%). In general, the L2 learner groups showed higher consistent accuracy with nonfinite than finite sentence types. In addition, advanced L2 learners also demonstrated an overall higher consistent accuracy than intermediate learners. While two of the intermediate L2 learners were consistently accurate with nonfinite sentence types, there were five advanced L2 learners who were consistently accurate with nonfinite sentence types. With finite sentence types, no intermediate L2 learners were consistently accurate compared to the two advanced L2 learners who were consistently accurate. The difference between intermediate and advanced L2 learners on accepting SOV and rejecting SVO sentence with finite verbs found in the individual results clearly supports Hypothesis 1. Although the advanced L2 learners were in general more consistently accurate in rejecting SVO structure than accepting

SOV structure, the one advanced learner who demonstrated an overall 100% consistent accuracy on all experimental items suggests that full syntactic competence of Neg-whQs at native-like level is attainable with continued exposure to L2 input.

To summarise, the L2 learner groups' results for the GJT confirmed hypothesis 1, except advanced L2 learners were not accepting the grammatical word order as accurate as they rejected the ungrammatical SVO one. Statistical analysis strongly suggested a difference between the intermediate and advanced learners in achieving native-like competence of Neg-whQs at syntax level. The successful acquisition of the SOV order of Neg-whQ$_{obj}$ constructions, from no movement in L1 English to obligatory movement in L2 Cantonese, depends on L2 learners' level of proficiency, perhaps as well the amount for L2 input received by the L2 learners as suggested by the better performance of the advanced groups. On the flip side, the results suggest the intermediate L2 learners struggle in their judgement of Neg-whQ$_{obj}$ constructions, with a significant difference in performance compared to the NSs across all types of sentences. This is accounted for by the lack of one-to-one morphological mapping between L1 English and L2 Cantonese for the colloquial Neg-whQ phrase, which slows down L2 acquisition as expected by Slabakova's Bottleneck Hypothesis (2006, 2008, 2010). However, the difficulty could be overcome with advanced proficiency and continued exposure to L2 input. The lack of a significant difference between the advanced L2 learners and NSs, in mean ratings of finite sentences, together with the consistency in rejecting the SVO order regardless of finiteness, suggests full L2 acquisition of Neg-whQ at syntax level is attainable. In contrast, the significant difference between intermediate L2 learners and NSs was found for all judgements which indicates the correlation between L2 proficiency and learners' performance. The one individual obtaining an overall 100% accuracy of all sentence types is one piece of evidence for FA to UG.

6.5. FINDINGS: CONTEXT-BASED JUDGEMENT TASK (CJT)

This task was designed to test L2 acquisition of the existential reading of a Neg-whQ$_{obj}$ construction at the semantic level. Experimental sentences with SPs$_{[+p]}$ were used to test learners' underlying competence of the [Quant:_] feature of a Neg-whQ. The four Cantonese sentence structures used in the CJT, previously shown in Table 19, are repeated in Table 35 for convenience.

Table 35. Sentence types for experimental items used in the CJT

Option	Sentence structure	Involved reading(s)
A	Subj Neg-whQ$_{obj}$ V SP$_{[+p]}$ (SOV structure with Neg-whQ$_{obj}$) e.g. I no-what like zaa$_3$	Existential 'only a few' (Lit. 'I like only a few things.')
B	Subj Neg V NPI$_{obj}$ (SVO structure with a negator and a negative polarity item) e.g. I don't like anybody	Negative (Lit. 'I don't like anybody.')
C	Subj NegQ$_{obj}$ V SP$_{[-p]}$ (SOV structure with ordinary negative quantifier object) e.g. I nobody like aa$_{(neutral)}$	Negative (Lit. 'I like nobody.')
D	Subj V Few$_{obj}$ SP$_{[+p]}$ (SVO structure with 'only a few' object) e.g. I like only a few people zaa$_3$	Existential 'only a few' (Lit. 'I like only a few things.')
E	'None of the above'	

Option A and D have existential reading and represent correct options to existential contexts, whereas option B and C have negative reading and represent correct options to negative contexts. Option A is the key sentence type with a Neg-whQ$_{obj}$ and SP$_{[+p]}$ (e.g. *zaa$_3$*) under investigation.

The CJT was designed as a preference test, in order to find out participants' preferred sentence types across different contexts. Therefore, no individual responses were excluded unless there is untruthful response from distractor items, for example leaving blank answers, below 50% accuracy rates in distractor items, and selecting Option E 'None of the above.' inappropriately. One advanced learner was excluded as a result. Since the CJT was administered as part of the second session of the experiment on a second day, some participants did not complete the CJT after completing the other two tasks in the first session as a result. The resulting sample size includes 21 NSs, 18 intermediate L2 learners and 20 advanced L2 learners.

6.5.1. DISTRACTORS

The purpose of analysing the results from the distractor items is to double-check the reliability of the CJT design. Random options (among A, B, C, D and E 'None of the above') were assigned relevant description to each context of the distractor items. Sometimes there was more than one option being relevant. Selection of any of the relevant options was considered an accurate response, while selection of any of the irrelevant options was considered an inaccurate response. Accuracy rate is measured by calculating the percentage of the number of correct response to the distractor items. Table 36 summarises the average and range of accuracy rates by all groups on distractor items.

Table 36. Main Study – Average and range of accuracy rates, in %, for distractors in the CJT

Group	Average Accuracy	Range
Int (n=18)	94	67:100
Adv (n=21)	92	40:100
NS (n=21)	93	67:100

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

All groups were very accurate in responding to distractor items. There were no blank responses in these items which confirm reliability of the task design. One advanced learner only reached 40% accuracy on these items and was thus excluded for the purpose of main analysis.

6.5.2. EXPERIMENTAL ITEMS

The results from NSs for each experimental item of both context types, existential and negative, are presented in this section. The data was analyzed by measuring, in percentage, average selections of each correct option to the 12 experimental items. Apart from measuring the percentage of any correct responses to the given context, the selection of both Option A, the Neg-whQ+$SP_{[+p]}$ constructions as the key investigation, and other correct response(s) is also calculated. By doing so, we compare learners' preference to Option A in the two context types, as well as detect participants' correct response by choosing existential sentence (Option D) in existential contexts and negative sentences (Option B and C) in negative contexts. First, we will first discuss results of experimental items with existential and negative contexts separately. Then, we will compare participants' selection of Neg-whQ+$SP_{[+p]}$ constructions in the two contexts.

For experimental items with an existential reading (Type EX), only Neg-whQ+$SP_{[+p]}$ constructions (Option A) and the 'only a few' constructions (Option D) were the correct response to the given context. Any selection of these two options (either A or D, or both) from natives was considered an accurate response. Any Type EX experimental item with >50% inaccurate selection of Options B or C, which have negative readings, was considered problematic context design. Table 37 summarises the results of individual Type EX item by the native group (see Table 14.2.A in Appendix 14.2 for all results).

Table 37. Item analysis of experimental items with existential contexts, in %, in the CJT by the native controls

Response	EX 01	EX 02	EX 03	*EX 04	EX 05	EX 06
Correct A/D	71%	90%	62%	10%	90%	86%
Incorrect B/C	14%	5%	10%	57%	0%	0%

Note. EX = experimental items with existential contexts; Correct A/D = percentage of participants selecting the correct option A or D, or both in existential contexts; Incorrect B/C = percentage of participants selecting the incorrect option B or C, or both in existential contexts; *Item excluded from the main analysis.

NSs consistently selected the inappropriate negative reading options and ignored the correct existential reading options in experimental item EX 04. Re-examination of EX 04 that the existential reading is indeed unclear. In light of this, responses to item EX 04 from all groups were excluded from further analysis. For the rest of the Ex items, NSs were more accurate in selecting the correct responses than the incorrect responses, which suggested the design of these items reliable. The following table summarises the percentage of correct responses for the five valid EX items considered.

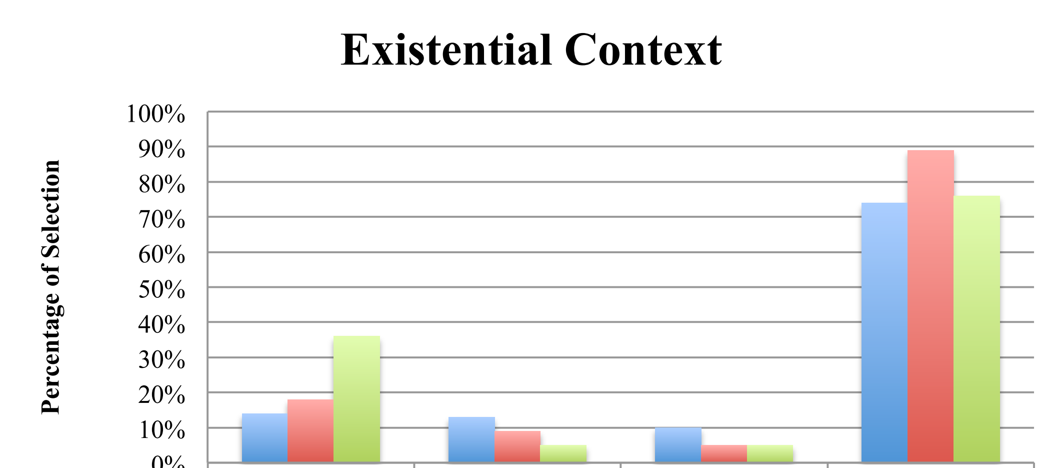
Table 38. Percentage of selecting correct responses in EX- experimental items (5) in the CJT

Response	Int (n=18)	Adv (n=20)	NS (n=21)
Correct A and D	10%	12%	26%
Correct A/D	70%	82%	80%

Note. EX = experimental items with existential contexts; Correct A and D = percentage of participants' selecting the correct options A and D, but neither option B nor C in existential contexts; Correct A/D = percentage of participants' selecting the correct options A or D, or both, but neither option B nor C in existential contexts; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

The results indicate that all groups were generally accurate in selecting options involving existential readings, option A or D, and ignoring those with negative readings, option B or C. Mean accuracy rates of all groups ranges between 70% and 82%, which suggests that the participants' responses were fairly accurate in selecting existential interpretations in EX items and their responses are highly reliable. Preference for selecting both option A, Neg-whQ+$SP_{[+p]}$ (e.g. She no-what bought ze1!), and D, 'only a few' (e.g. *She bought only a few things*.), for the same item suggests participants' awareness to the 'only a few' reading of the Neg-whQ+$SP_{[+p]}$ constructions. The native group had the highest percentage of 25.71% in selecting both option A and D for the same item, in contrast to only 10% by the intermediate and 12% by the advanced learner groups.

Figure 7. Average selection of individual options A, B, C and D for EX items of the CJT



	A (Neg-whQ)	B (Neg+NPI)	C (NegQ)	D (only a few)
Int (n=18)	14.00%	13%	10%	74%
Adv (n=20)	18%	9%	5%	89%
NS (n=21)	36%	5%	5%	76%

Note. Neg = negator; NPI = negative polarity item; NegQ = negative quantifiers; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

The percentages of selecting either option B or C, associated to negative readings, was fairly low among all groups and ranges from 5 to 13%. In comparison, the selection of appropriate option D is high, expected for the existential contexts tested in these items, and ranges from 74 to 89%. Option A with the Neg-whQ+$SP_{[+p]}$ structure, also appropriate for existential contexts, is the key experimental construction and was selected by NSs on average at the rate of 36%. By contrast, the L2 learner groups were half as likely as the control group to select option A. Intermediate L2 learners selected option A at the rate of 14% while the advanced L2 learners did so at the rate of 18%. A 3 (group) x 3 (condition) full-factorial ANOVA examined the effects of group (the native control, intermediate and advanced L2 group) and experimental conditions (selection option A, selecting option A and D, selecting option A or D) found the interaction between group and the condition selecting option A ($F_{2,58}$ = 3.28, p=.045, partial eta-squared = .105, power = .60). Although a Games-Howell post hoc test indicated no significant difference between groups in selecting Option A, the statistical difference between NSs and intermediate L2 learners was close to significance (p = .057) (see Appendix 14.2 for full results).

Turning to the experimental items testing negative contexts (Type NEG), option B, NPI constructions, and option C, NegQ constructions, are the two correct responses. Any selection of either option B or C but not D from NSs is considered accurate response. Any selection of option D at the rate of over 50% in NEG items by the control group were considered problematic to the design. Table 39 below displays the control responses to individual NEG experimental items (see Table 14.3.A in Appendix 14.3 for descriptive statistics).

Table 39. Item analysis of experimental items with negative contexts, in %, in the CTJ by the native controls

Response	NEG 01	NEG 02	NEG 03	NEG 04	*NEG 05	*NEG 06
Correct B/C	81%	90%	90%	67%	29%	19%
Incorrect D	5%	10%	5%	5%	57%	76%

Note. NEG = experimental items with negative contexts; Correct B/C = percentage of participants selecting the correct option B or C, or both in negative contexts; Incorrect D = percentage of participants selecting the incorrect option D in negative contexts; *Item excluded from the main analysis.

Experimental items NEG 05 and NEG 06 were rarely answered with a correct negative reading options B or C but not D, but were frequently answered with the inappropriate option D. Careful examination indicates contexts for the two items would possibly lead to participants' disbelief to an absolute negative reading.[23] Responses from these items were thus excluded.

[23] Context of item NEG05 is about a woman, Dora, not holding any grudges against anybody as a friendly person. An absolute negative reading of her not being angry with someone could lead to doubt to the case. Context of item NEG06, instead, is about Michelle losing her wallet and her not looking over any places at all before reporting the loss. This also suggests leading to disbelief to an absolute reading. The items therefore might have been problematic.

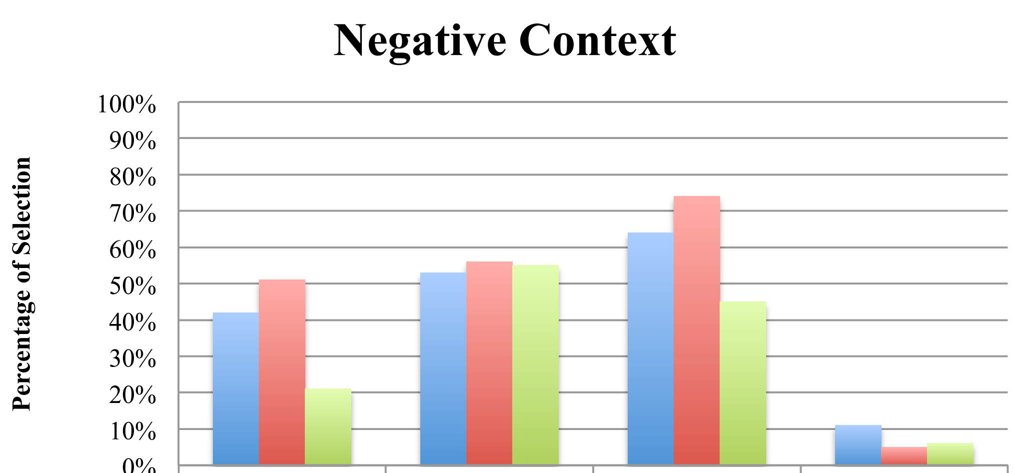
Table 40. Percentage of selecting incorrect and correct responses in NEG-experimental items (4) in the CJT

	Int (n=18)	Adv (n=20)	NS (n=21)
Incorrect A and (B or C or both)	40% [34.45]	48% [38.81]	7% [17.93]
Correct B/C	83% [24.25]	85% [20.52]	82% [23.90]

Note. NEG = experimental items with negative contexts; Incorrect A and (B or C or both) = percentage of participants' selecting the incorrect options A and the correct option B or C or both in negative contexts; Correct B/C = percentage of participants' selecting the correct options B or C, or both, but neither option A nor D in negative contexts; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

All groups were fairly accurate in selecting the correct negative options B or C in NEG items, as shown by the average accuracy percentage range of 82 to 85%. The $SP_{[+p]}$ *ze*1 was used in all Option A sentences of the experimental items. As discussed earlier, a Neg-whQ+$SP_{[+p]}$ construction has only existential 'only a few' reading. Therefore, selection of option A in negative contexts was not expected from the NSs. As predicted, the NSs selected only 7% inaccurate responses, whereas, the intermediate and advanced L2 learners selected 40 and 47% inaccurate responses respectively. A 3 (group) x 3 (condition) full-factorial ANOVA examined the effects of group (the native control, intermediate and advanced L2 group) and experimental conditions (selecting option A, selecting option A and (B or C or both), and selecting either option A or B or C) found the interaction between group and the condition selecting option A ($F_{2,58}$ = 3.965, p = .025, partial eta-squared = .124, power = .688) and between group and the condition selecting option A and (either B or C or both) ($F_{2,58}$ = 9.606, p = .000, partial eta-squared = .255, power = .976) (see Table 14.3.C in Appendix 14.3). A games-Howell post hoc test indicates a significant difference between NSs and advanced L2 learners in their selection of option A (p = .024). In addition, there was a significant difference between NSs and intermediate L2 learners (p= .001) on their mean rating of inaccurate responses selecting option A and (either B or C) together, but no significant difference between L2 groups (p = .817). NSs were not likely to select option A and (either B or C or both) together, whereas L2 learners were very likely to select these incorrect responses.

Figure 8. Average selection of individual options A, B, C and D for the NEG- items of the CJT



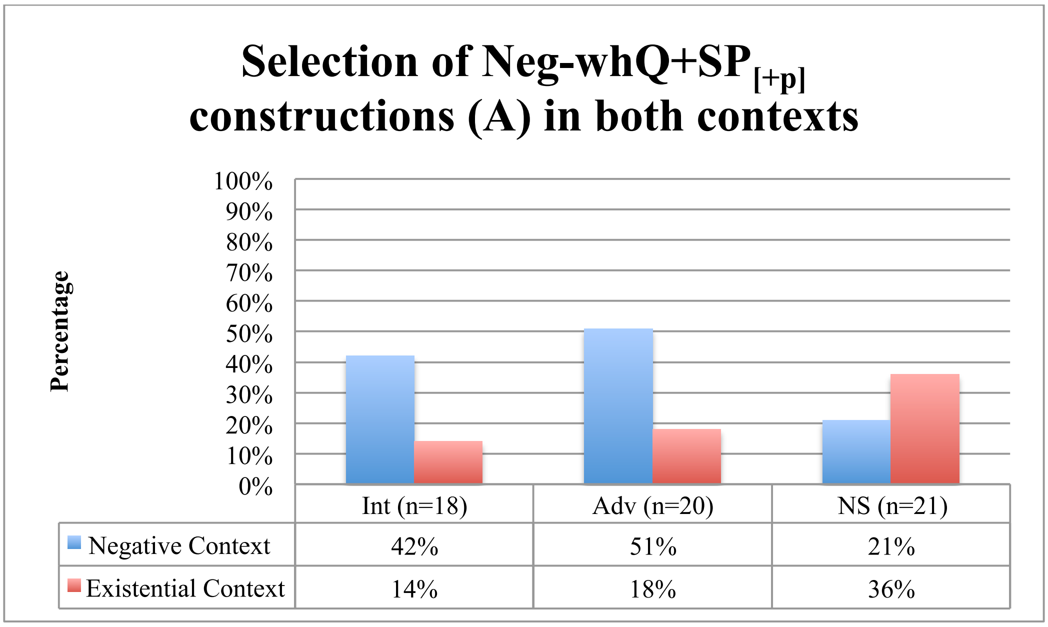
	A (Neg-whQ)	B (Neg+NPI)	C (NegQ)	D (only a few)
Int (n=18)	42%	53%	64%	11%
Adv (n=20)	51%	56%	74%	5%
NS (n=21)	21%	55%	45%	6%

Note. Neg = negator; NPI = negative polarity item; NegQ = negative quantifiers; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Figure 8 shows all groups selected option D to a low degree, ranging from 5 to 11.11% while B and C were the most frequent responses. As for option A, the NSs' average rate for selecting this option was the lowest at 21%, compared to the intermediate and advanced L2 group who selected option A at the rate of 42 and 51% respectively.

Figure 9 reports participants' percentage in selecting option A in the two contexts.

Figure 9. Main Study – A comparison of average selections of Neg-whQ+$SP_{[+p]}$ constructions (A) in both contexts in the CJT by all groups



Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Comparing option A, the key Neg-whQ+$SP_{[+p]}$ construction, across the two contexts, existential and negative, reveals a distinct increase in selection rate from negative to existential contexts for the NS group, whereas both L2 groups showed the opposite trend: a fairly high average selection of option A that decreases sharply from negative to existential contexts. A repeated measures ANOVA testing independent variable context and dependent variable group indicates a main effect for context ($F_{1,56} = 6.419$, $p = .014$, partial eta-squared = .103, power = .702) (see Table 14.4.B in Appendix 14.4 for full results), and a significant interaction between the context and group ($F_{2,56} = 6.570$, $p = .003$, partial eta-squared = .190, power = .895).

6.5.3. DISCUSSION

The aim of the CJT was to investigate whether L2 learners successfully acquire the existential reading and the negative reading of Cantonese Neg-$whQs_{obj}$. Results of the GJT in section 6.4 suggested that intermediate learners struggled with the syntax of Neg-whQs because they failed to accept SOV order, in contrast to the L2 group. The dual interpretation of Neg-whQ_{obj} constructions was predicted to be problematic to L2 learners and hinder ultimate attainment thereof. To learn the existential reading of a Neg-whQ_{obj}, adding the [Quant:_] feature to the feature set is required. The additional existential reading is mainly triggered by the unpronounced quantifier operator Ø that carries a [Quant:_] feature in the {mou {Ø, *wh*-words}} structure. Comparing to the simpler {no, where} structure of English Neg-whQ (e.g. *nowhere*), the [Quant:_] feature of Ø is absent in English Neg-whQ feature set. Therefore, hypotheses were set based on the condition of whether [Quant:_] feature is added to the Cantonese Neg-whQ feature set. The two related hypotheses are repeated below in (279).

279. Semantics of Neg-whQs:

EITHER: Failure to add the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 2: L2 learners, regardless of their proficiency level, will fail to acquire the implied existential interpretation of Neg-whQ+$SP_{[+p]}$ constructions. They will reject these constructions in existential contexts and accept them only in negative contexts.

OR: Success in adding the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 3: Advanced learners, but not intermediate learners, will correctly accept the implied existential interpretation of Neg-whQ+$SP_{[+p]}$ constructions in existential contexts but not negative contexts.

Hypothesis 2 predicted that L2 learners would attempt to map the closest counterparts in English to L2 Cantonese Neg-whQs, that is ordinary English NegQs such as *nowhere* which have a simpler {no, NP} structure and lack the [Quant:_] feature. Furthermore, given that the investigation targeted intermediate and advanced L2 learners of Cantonese, I assumed learners at this stage of interlanguage development had already acquired ordinary NegQs in Cantonese. This prediction was indeed met because results from NegQ distractors in the GJT showed that L2 learners, at least, were aware of the syntax (i.e. SOV order) associated to constructions with a $NegQ_{obj}$.

Another prediction tied to Hypothesis 2 is that L2 learners would fail to acquire the existential reading if Cantonese Neg-whQs were mapped to English NegQs. This is because NegQs in English do not observe the SOV word order and only have a negative reading. Another possibility, though, was that L2 learners would map Cantonese Neg-whQs to Cantonese NegQs by default, which would result in difficulty assigning an existential reading to Neg-whQ$_{obj}$ constructions. Assigning existential reading to the new Neg-whQ$_{obj}$ constructions was supposed for two reasons: i) the dual interpretation of Neg-whQs; ii) the fact that the existential and negative readings are not in complementary distribution. The two Neg-whQ readings arise from either an SOV or SOV+SP structure. Unless a licensing relationship absent in their L1 grammar, between a Neg-whQ$_{obj}$ and a pragmatic cue, namely rising tone at the end of the sentence or the SP with [+p] feature, at interface level, is acquired, L2 learners would not acquire the existential reading of Neg-whQs.

In the CJT, we only tested the Neg-whQ$_{obj}$ and SP$_{[+p]}$ interaction, where valuing [Quant: p] by [+p] in SPs triggers the existential reading. Thus, Hypothesis 3 would be proved and FA to UG in Schwartz and Sprouse's FT/FA model (1994, 1996) would also be supported, if learners achieving advanced priciency correctly accept the implied existential interpretation of a Neg-whQ$_{obj}$ in existential contexts but not negative contexts.

Group results from the CJT support Hypothesis 2. In particular, there were three findings that supported this hypothesis. First, L2 learners, regardless of proficiency level, tended to select Neg-whQ+SP$_{[+p]}$ constructions in negative rather than existential contexts. The two L2 groups selected Neg-whQ+SP$_{[+p]}$ constructions more often in negative than existential contexts. Furthermore, L2 learners displayed the opposite pattern of the NS's one. Statistical analysis showed that the two independent variables, context and group, interacted statistically, and that both intermediate and advanced L2 learners did not acquire the existential reading of a Neg-whQ+SP$_{[+p]}$ construction. This finding was deduced by their tendency to associate Neg-whQs with the negative reading and incorrectly prefer Neg-whQ+SP$_{[+p]}$ constructions in negative contexts.

Second, the results showed that both L2 groups incorrectly selected both Neg-whQ+SP$_{[+p]}$ constructions and negative constructions together for items testing negative contexts at the rate of 40% or more. Therefore, the results indicated neither of the L2 learner groups treated Neg-whQ+SP$_{[+p]}$ constructions differently from negative constructions like NSs did. As discussed in Chapter 3, a Neg-whQ+SP$_{[+p]}$ construction requires an existential 'only a few' reading suppressing the negative reading. Results from the NSs who selected Neg-whQ+SP$_{[+p]}$ and either or both negative constructions together only at the rate of 7% confirm the theory of Neg-whQs discussed in Chapter 3. A statistically significant difference was found between the NSs and both L2 groups for average rate of incorrect responses, whereby both L2 groups selected incorrect responses to items testing negative contexts to a far greater extent than the NSs. In light of this, I argued that learners, even at advanced L2 proficiency level, fail to disassociate the Neg-whQ+$SP_{[+p]}$ construction from the negative interpretation.

Next, results from items testing existential readings also suggested L2 learners' failure to acquire the existential reading of Neg-whQs. L2 learners only selected Neg-whQ+$SP_{[+p]}$ constructions at the rate of 14 to 18% in existential contexts, while they were generally accurate in selecting the 'only a few'+SP construction at the rate of 70 to 82%. In participants' responses to items testing existential readings, L2 learners only selected Neg-whQ+$SP_{[+p]}$ and 'only a few'+SP constructions together at the rate of 10 to 12% whereas NSs were twice as likely to select the same response at the rate of 26%. Statistical analysis indicated an effect of group on selecting Neg-whQ+$SP_{[+p]}$ and 'only a few'+SP constructions together or Neg-whQ+$SP_{[+p]}$ constructions alone in in existential contexts. Eleven out of 18 intermediate and 11 out of 20 advanced L2 learners consistently rejected Neg-whQ+$SP_{[+p]}$ constructions in all items testing existential readings. Altogether these findings show that L2 learners failed to associate Neg-whQ+$SP_{[+p]}$ constructions with the existential reading. Group results suggested that the licensing relationship, absent in the L1, of a Neg-whQ_{obj} and an $SP_{[+p]}$ at interface level had not been successfully built in the L2 learners' interlanguage. L2 learners were accurate in selecting 'only a few' and $SP_{[+p]}$ constructions in existential contexts. Therefore, L2 learners are likely to struggle in acquiring the existential reading of Neg-whQs, even in the presence of a licensing $SP_{[+p]}$. Results showed that learners, regardless of their L2 proficiency level, failed to add the [Quant:_] feature to the Cantonese Neg-whQ feature set. In addition, it is evident that the complex morphology of Neg-whQs ({mou {Ø, *wh*-words}}) is the 'bottleneck' (Slabakova, 2006, 2008, 2010) and leads to delays in L2 acquisition even for advanced level learners.

In spite of the failed acquisition discussed so far, two individual advanced L2 learners, Adv06 and Adv21, actually showed native-like competence with Neg-whQs. The participants accepted Neg-whQ+$SP_{[+p]}$ constructions in existential contexts to a high extent but substantially rejected them in negative contexts. It is possible that these two learners had been exposed to enough input to stimulate the acquisition of

[Quant:_]. Table 41 reports the individual selections made by Adv06 and Adv21 for all experimental items testing existential and negative readings.

Table 41. Main Study – Responses from the two individual advanced learners with native-like competence in the CJT

ID	Ex01	Ex02	Ex03	Ex05	Ex06	NEG01	NEG02	NEG03	NEG04
Adv06	A	A/D	A/D	A/D	A/D	C	B/C	B/C	B/C
Adv21	A/D	A/D	A/C/D	A/D	A/D	B/C	B	A/B/C	B/C

Note. EX = experimental items with existential contexts; NEG = experimental items with negative contexts; Adv = advanced.

Individual Adv06 showed 100% native-like competence in selecting Neg-whQ+$SP_{[+p]}$ constructions only in existential but not negative contexts, while individual Adv21 also had a tendency in doing the same. The consistency data from individual Adv06 confirm Hypothesis 3 that the L2 Cantonese [Quant:_] feature can be added to the Neg-whQ feature set in interlanguage grammars. Finally, the response pattern of this learner is compatible with FA (Schwartz and Sprouse, 1996). In addition, adult learners could possibly overcome the 'bottleneck' (Slabakova, 2006, 2008, 2010) in achieving native-like competence with the dual interpretation of Neg-whQs.

6.6. FINDINGS: PICTURE JUDGEMENT TASK (PJT)

The PJT was designed to investigate whether the absence of a [Quant:_] feature in the learners' L1 English affects L2 acquisition of the dual reading of Cantonese Neg-whQs. The purpose is to test whether the complex morphology of Neg-whQs ({mou, {Ø, *wh*-words}}) represents a 'bottleneck' in adult L2 acquisition. In chapter 4 it was shown that the change of interpretation of a doubly quantified construction involving a subject Neg-whQ as a result of scrambling represents a true POS problem. L2 learners are predicted to fail distinguishing the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V form from the scrambled $\forall_{obj}$ Neg-whQ_{subj} V which involves the syntax semantics interface. They are also expected to treat the $\forall_{obj}$ Neg-whQ_{subj} V structure as a free form of the Neg-whQ_{subj} $\forall_{obj}$ V structure due to the change of interpretation as a result of scrambling is underdetermined by their L1 grammar and the L2 input. In particular, there is no existential reading of Neg-whQ and no scrambling being available in English, and no evidence for the change of interpretation as a result of scrambling in L2 Cantonese input. Acquisition relies on whether the [Quant:_] feature can, on the one hand, be added to the Cantonese Neg-whQ feature set, and whether POS concerning the change of interpretation can be overcome, on the other. FA (Schwartz and Sprouse, 1996) would be supported if learners overcome such POS problem.

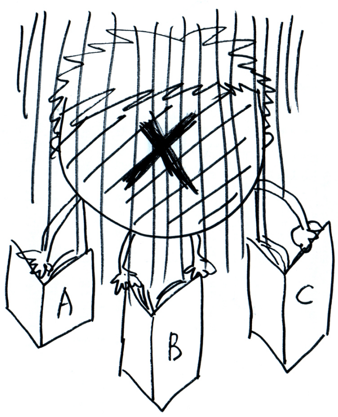
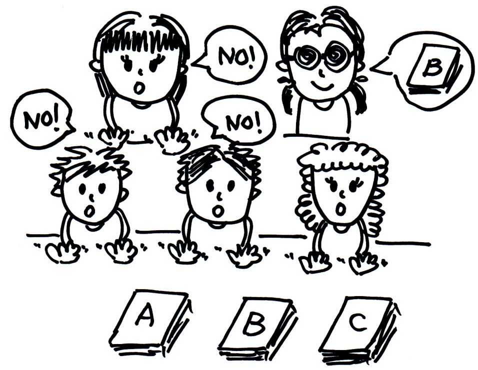
Participants were asked to grade the possibility of associating a sentence to two pictures. Examples for distractor and experimental items are given in Table 42 and 43 respectively for convenience.

Table 42. Examples of distractor items of the PJT for the main study

Information	Non-scrambled	Scrambled
Type	NegQ > Num	Num > NegQ
Structure	$NegQ_{subj}$ Num_{obj} V	Num_{obj} $NegQ_{subj}$ V
Example	Mou-daaijan sik loen-bui syutgou No-adult eat two-cup ice-cream 'No adult eats two cups of ice-cream.'	Loen-bui syutgou dou mou-daaijan sik Two-cup ice-cream also no-adult eat 'For the two cups of ice-cream, there is no adult who eats any of them.'
Reading:	Subject-wide	Object-wide
Corresponding picture		

Distractors involve constructions with a $NegQ_{subj}$ and a Num_{obj}. Scrambling of these constructions changes the focus of interpretation. The $NegQ_{subj}$ takes wide-scope in the non-scrambled $NegQ_{subj}$ Num_{obj}V structure whereas the numeric object takes wide-scope in the scrambled Num_{obj} $NegQ_{subj}$ V structure. Two pictures were presented in each distractor item, one matching and one mismatching the interpretation of the distractor sentence. For a correct match, a non-scrambled sentence had to be paired with a subject-wide picture and a scrambled sentence had to be paired with an object-wide picture, otherwise the sentence picture pair is a mismatch.

Table 43. Examples of experimental items of the PJT for the main study

Information	Non-scrambled	Scrambled
Type	Neg-whQ > $\forall$	$\forall$ > Neg-whQ
Structure	Neg-whQ_{subj} $\forall_{obj}$ V	$\forall_{obj}$ Neg-whQ_{subj} V
Example	*Mou-bingo* mui-buin sju dou seung taai No-who every-CL book also want read 'Nobody wants to read all the books.' (In other words, 'Somebody reads some books.'	Mui-buin sju dou *mou-bingo* seung taai Every-CL book also no-who want read 'For each one of the books, there is nobody/only a few people who want(s) to read it.'
Reading	Collective	Distributive and 'Only a few'
Corresponding picture		

For the experimental items, the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V construction in Cantonese involves only a collective reading on the one hand. The picture on the left in Table 43 depicts the collective reading and represents a match for non-scrambled sentences ('collective' pictures). On the other hand, only a distributive reading can be assigned to the scrambled $\forall_{obj}$ Neg-whQ_{subj} V construction. In addition, the existential 'only a few' reading of the Neg-whQ_{subj} is triggered when the $\forall_{obj}$ precedes Neg-whQ_{subj} as a result of scrambling. Therefore, the picture on the right in Table 43 was designed to depict both the distributive and the 'only a few' reading ('distributive' picture). In all scrambled structures, only pictures with both the distributive and 'only a few' readings represent the correct interpretation. The 'distributive' picture is a match to the scrambled structure, whereas the 'collective' picture is a mismatch to the scrambled structure.

For the purpose of analysing the data, mean rating and accuracy rate are used. First, the rating scale of '-2', '-1', '+1' and '+2' is transformed to to '0', '1', '2' and '3'. Mean ratings were calculated by dividing the sum of scores on a particular sentence type by the number of tokens of the type. A score above 1.5 score equivalent to ratings '+1' or '+2', represents acceptance of pictures associated the interpretation of the given sentence, while a score below 1.5 equivalent to '1' or '-2', represents rejection of pictures associated to the interpretation of the given sentence. The difference of scores for rating the two pictures was analyzed as participants' preference for one reading over the other. Second, the rate of positive or negative scores is used for the data analysis. It is calculated by counting the number of positive scores divided by the number of items of correct sentence-picture match; and counting the number of negative scores divided by the number of items of sentence-picture mismatch.

The validity of PJT is also supported by Conroy's (2008) whereby participants are more likely to match the interpretation of a sentence to a preferred picture when two pictures are given. The PJT was administered as the second task in the first session of the experiment. One individual from the native group left an all-blank response in the PJT, and therefore responses from this individual is excluded for data analysis. In order to guarantee reliable responses from all participants, individual responses were excluded if an individual selected 'Can't decide' or left blank answer more than once for the distractor items and > 3 (10% of the 40 test tokens) times for the experimental items.

Table 44 summarises the number of participants in each group falling into this category.

Table 44. Main Study – Number of participants' data excluded by choosing 'Can't decide' or blank answer >1 distractor items and >3 experimental items in the PJT

Group	Distractor items (n=20)		Experimental items (n=40)		Total no. of participants excluded
	No. of participants excluded	Maximum no. of 'Can't decide' / blank answer by individual	No. of participants excluded	Maximum no. of 'Can't decide' / blank answer by individual	
NS (n=55)	22	3	27	11	28
Int (n=30)	8	4	6	8	8
Adv (n=25)	6	10	3	10	7

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; Total number of 'Can't decide' in percentage by NS is 0.27%, by Int is 0.67%, and by Adv is 0.2%; Total number of blank answer in percentage by NS is 1.27%, by Int is 0.67%, and by Adv is 0.7%.

As a result, there were altogether 28 from the native group, 8 from intermediate learners and 7 from the advanced learners falling into this category. Therefore, their data was excluded for the main analysis. The resulting size for data analysis of each group was: 27 control natives, 22 intermediate learners and 18 advanced learners. Data from these participants is reported in section 6.6.1 and 6.6.2

6.6.1. DISTRACTORS

This section provides results for distractor items. Looking at participants' responses to distractor items of the PJT, it shows the reliability of the methodology of the task. Table 45 and Table 46 illustrate participants' average ratings to individual distractor with matching sentence-picture and sentence-picture mismatch by all groups.

Table 45. Item analysis where the sentence and the picture matched in the PJT by the NSs

Group		Item										Average
	Code	01	02	03	04	05	06	07	08	09	10	
NS	Mean	2.11	2.89	2.52	2.78	2.96	2.81	2.19	2.19	2.81	2.26	2.55
(n=27)	SD	1.05	0.32	0.94	0.64	0.19	0.48	1.08	1.11	0.48	1.06	0.41
	Acc	74%	100%	85%	96%	100%	96%	74%	78%	96%	78%	88%

Note. Acc = Accuracy Rate; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Distractors with an average NS rate between 1 and 2 and a standard deviation greater than 1 were considered potentially unreliable. Table 46 shows that none of the individual item with matching sentence and picture falls into this category.

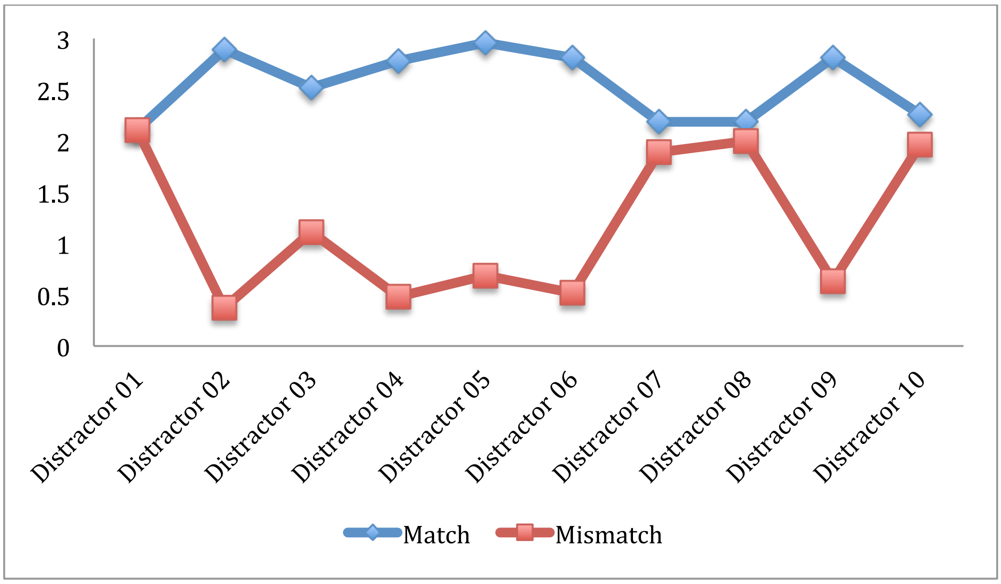
Table 46. Item analysis where the sentence and the picture mismatched in the PJT by the NSs

Group		Item										Average
	Code	01	02	03	04	05	06	07	08	09	10	
NS	Mean	2.11	0.37	1.11	0.48	0.69	0.52	1.89	2.00	0.63	1.96	1.17
(n=27)	SD	0.97	0.63	1.09	0.94	0.96	0.75	1.12	1.11	0.88	1.09	0.51
	Acc	19%	93%	56%	86%	78%	93%	26%	30%	78%	30%	59%

Note. Acc = Accuracy Rate; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Three individual item with mismatching sentence and picture as shown in Table 47, item 03, 07 and 10, fall into the problematic category. However, the average rates from both Table 45 and 46 suggested reliability of the task design. Figure 10 is a visual representation of an item analysis specific to the NS group reported as mean ratings.

Figure 10. Visual representation of the item analysis specific to the NS group in the PJT



Note. Match = matching sentence and picture; Mismatch = Mismatching sentence and picture.

Figure 10 suggests that NSs consistently rate a higher score for the matching picture than the mismatching one for each distractor item. The average rates of all distractors from all groups are represented graphically in Figure 11.

Figure 11. Main Study – Overall mean ratings of the distractors in the PJT by groups

	NS (n=27)	Int (n=22)	Adv (n=18)
Match	2.55	2.02	2.25
Mismatch	1.17	1.3	1.72

Note. Match = matching sentence and picture; Mismatch = mismatching sentence and picture; NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

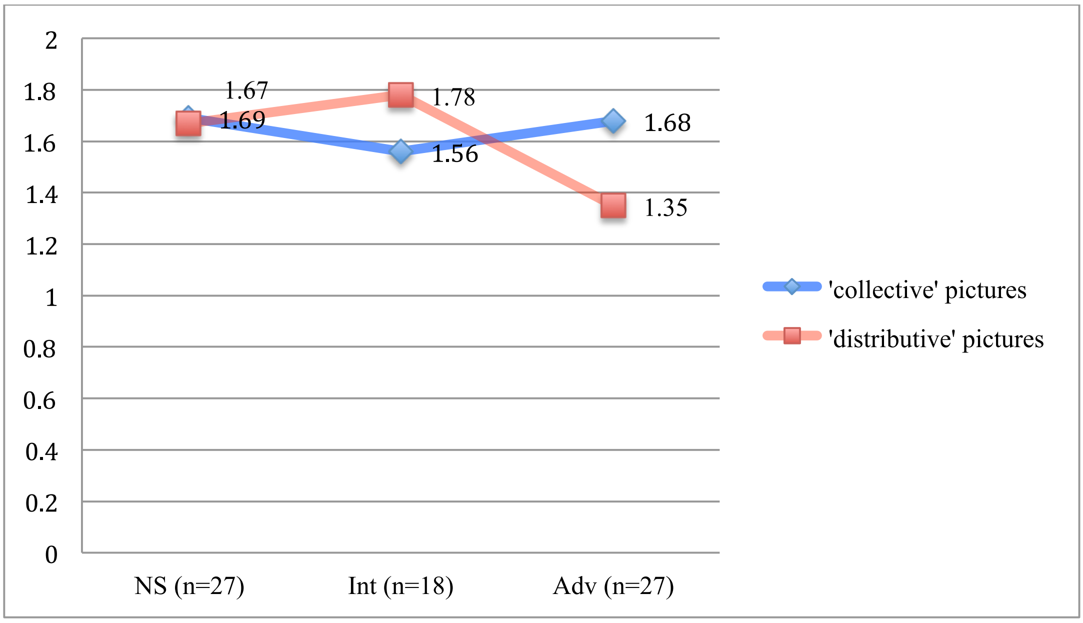
Results in Figure 11 suggest all groups tend to accurate on items where the sentence and picture match rather than items where the sentence and picture mismatch. On the one hand, these results confirm that all participants were aware of the change of focus in a doubly quantified construction involving a $NegQ_{subj}$ and a Num_{obj} induced by scrambling. On the other, results of distractor items show that participants showed a preference towards the matching picture than the mismatching one when two picture were given, which confirms the validity of the task design. Additional support for the validity of the task comes from the NS group who consistently distinguished sentence-picture match from sentence-picture mismatch. Hence, the results from the distractor items confirm the reliability of the task design and individual responses from all groups.

6.6.2. EXPERIMENTAL ITEMS

In this section, we compare participants' ratings to the two pictures as corresponding interpretations to a given sentence in each item. Rather than focusing on accuracy, participants' responses are analysed as preference towards one picture over the other, where each picture represents a collective or distributive plus 'only a few' reading, to be matched to either a non-scrambled or scrambled sentence. Literature suggests that double quantifier interpretations are often difficult and unanimous judgments are not always observed (Yamakowhi, 2006; Lee *et al*, 1999; etc). In addition, we attempted to use pictures to depict abstract negative interpretations. Although shadings and crosses on a figure's face representing nonexistence were provided in two examples, 100% consistency was not necessarily expected because the two readings represented in the two pictures are not in complementary distribution. The collective reading (e.g. *Nobody* $V_{do\text{-}something}$ *all y*) does not preclude the partial meaning (e.g. *Somebody* $V_{do\text{-}something}$ *some y*), which could be an implied interpretation represented in 'distributive' pictures. Therefore, both pictures were a possible match to a non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V construction and a consistent preference towards either picture was not expected in experimental items testing the non-scrambled Neg-whQ_{subj} $\forall_{obj}$ V structure. Results of the two sentence types will be discussed separately.

We will first look at results of non-scrambled items. Figure 12 compares mean ratings of non-scrambled type by all groups.

Figure 12. Mean rating of non-scrambled items in the PJT

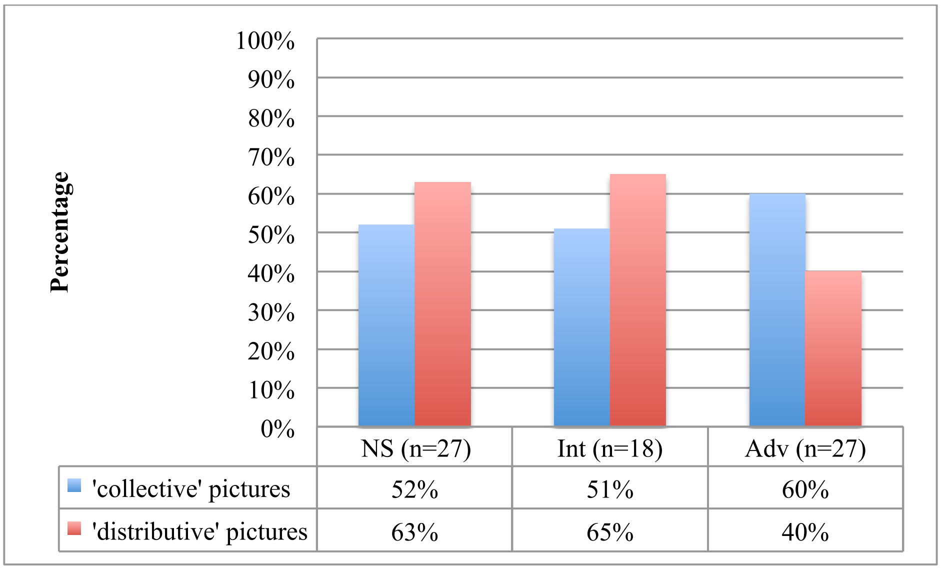


Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

When non-scrambled sentences were presented, all groups tended to equally accepted the collective and distributive readings, as shown by the mean ratings range of 1.35 - 1.78. Both NSs and advanced L2 learners generally rated in average a higher score to ‘collective’ pictures than ‘distributive’ pictures. In contrast, intermediate L2 learners showed the opposite pattern. The results, thus, confirm the prediction that participants would accept both the collective *nobody eat all the sandwich* reading and the distributive *for each sandwich, only a few/none of the people eat it* reading. A repeated measures ANOVA with picture type as the independent variable and group as the dependent shows no effect of picture type ($F_{1,64}$ = .117, p = .734, partial eta-squared = .002, power = .063) and no significant interaction between picture type and group ($F_{2,64}$ = 1.539, p = .222, partial eta-squared = .046, power = .316) (see Appendix 15.5 for full details).

Figure 13 shows the percentage of positive rating to the two pictures associated to non-scrambled sentences.

Figure 13. Percentage of positive rating for pictures associated to non-scrambled sentences in the PJT

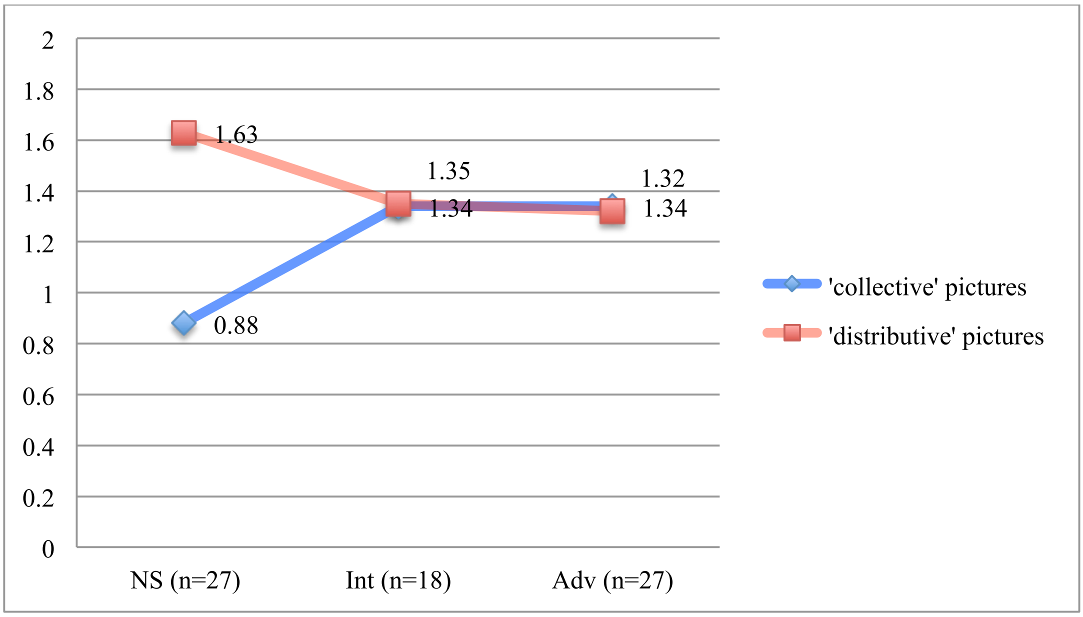


Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

Both NSs and intermediate L2 learners often assigned higher ratings to ‘distributive’ pictures (52 and 51% respectively) than ‘collective’ pictures (63 and 65% respectively). Results suggested that these two groups preferred the partial reading implied in distributive pictures originally designed to depict the distributive plus ‘only a few’ reading. In contrast, advanced L2 learners showed the opposite pattern and assigned higher ratings to ‘collective’ pictures (60%) than ‘distributive’ pictures (40%). A repeated measures ANOVA with picture type as the independent variable and group as the dependent shows no effect of picture type ($F_{1,64}$ = .188, p = .666, partial eta-squared = .003, power = .071) and group ($F_{2,64}$ = 1.103, p = .338, partial eta-squared = .033, power = .236), but a significant interaction of picture type and group ($F_{2,64}$ = 3.160, p = .049, partial eta-squared = .090, power = .586) (see Appendix 15.8 for full details).

We now turn to results of the scrambled sentences. Figure 14 compares mean ratings of scrambled type by all groups.

Figure 14. Mean rating of scrambled items in the PJT

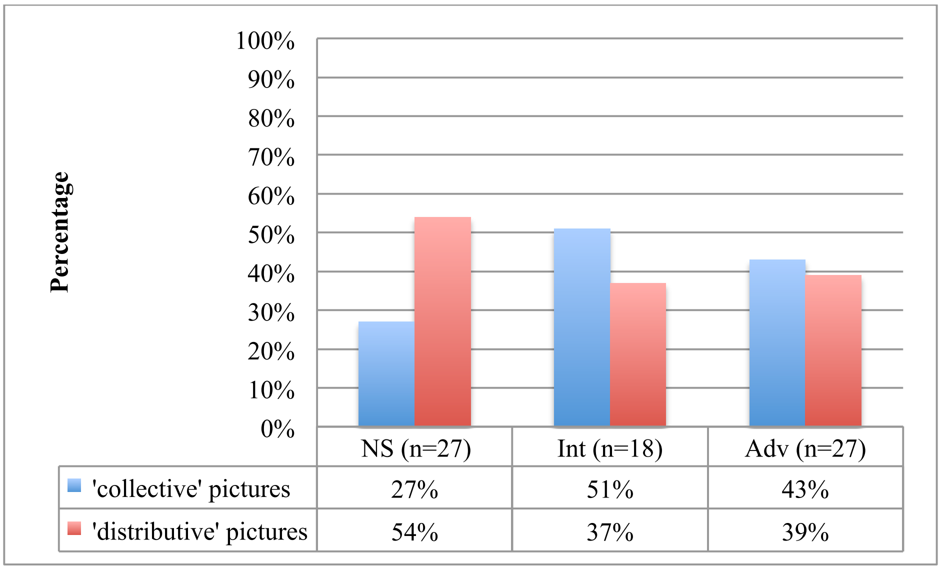


Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

As predicted, the NSs largely rejected 'collective' pictures (mean = 0.88) and accepted 'distributive' pictures (mean = 1.63). These results are consistent with the discussion presented in chapter 3 claiming collective readings are not available in scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V sentences. In contrast, both L2 groups similarly rated both picture types at an average below 1.5. Thus, there is not a clear distinction between the readings and groups. A repeated measures ANOVA with picture type as the independent variable and group as the dependent shows a main effect of picture type ($F_{1,64}$ = 4.921, p = .030, partial eta-squared = .071, power = .589) and no effect of group ($F_{2,64}$ = 0.412, p = .664, partial eta-squared = .013, power = .114), and a significant interaction picture type and group ($F_{2,64}$ = 2.293, p = .005, partial eta-squared = .152, power = .850) (see Appendix 15.6 for full results). A one-way ANOVA, testing mean ratings of 'collective' pictures associated to scrambled sentences as a dependent variable, indicates a main effect of group (F2,66 = 4.055, p = .022); and a post hoc Games-Howell test indicates a significant difference between the NSs and intermediate L2 learners (p = .028) (see Appendix 15.8 for full details).

Next we report participants' tendency of assigning positive rates to the two pictures associated to scrambled sentences. Figure 15 shows the percentage of positive rates assigned to the two pictures by all groups.

Figure 15. Percentage of positive rating for pictures associated to scrambled sentences in the PJT

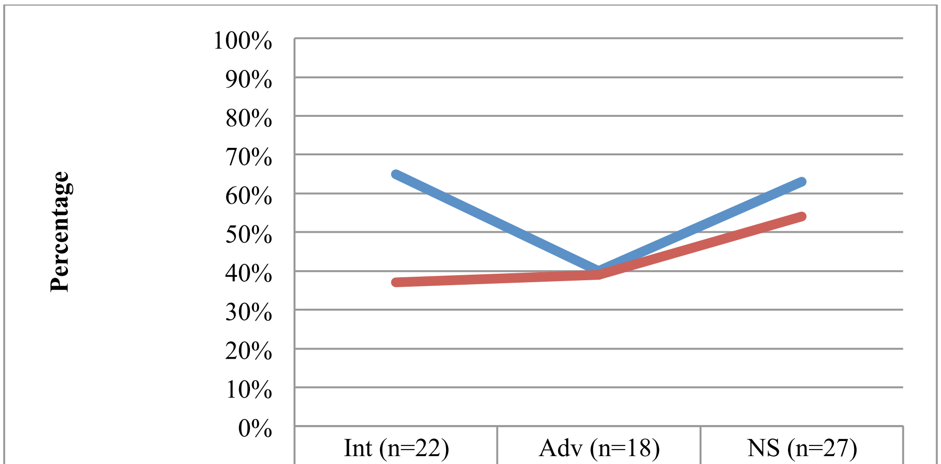


Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

The NS group rated ‘distributive’ pictures with a positive score more often in the rate of 54% than ‘collective’ pictures in the rate of 27%. This suggests that they are capable of correctly precluding the collective reading in favour of the distributive plus ‘only a few’ reading for scrambled sentences. Both L2 groups, by contrast, were inaccurate as reflected from their preference and they generally preferred ‘collective’ pictures. Intermediate L2 learners rated ‘collective’ pictures more positive than ‘distributive’ pictures, respectively 51 versus 37%, compared to 43 versus 39% for the advanced group. The differences shown by both groups suggest L2 learners were less likely to associate ‘distributive’ to scrambled sentences. A repeated measures ANOVA with picture type as the independent variable and group as the dependent shows no effect of picture type ($F_{1,64}$ = .245, p = .623, partial eta-squared = .004, power = .078) and group ($F_{2,64}$ = .800, p = .454, partial eta-squared = .024, power = .181), but a significant interaction of picture type and group ($F_{1,64}$ = 6.769, p = .002, partial eta-squared = .175, power = .906) (see Appendix 15.9 for full results). A one-way ANOVA, testing percentage of positive ratings for ‘collective’ pictures associated to scrambled sentences as a dependent variable, indicates a main effect of group (F2,66 = 6.620, p = .002); and a post hoc Games-Howell test indicates a significant difference between the NSs and intermediate L2 learners (p = .001) (see Appendix 15.9 for full details).

On mean rating, a repeated measure of ANOVA testing the two independent variables, sentence type (non-scrambled versus scrambled), picture type ('collective' versus 'distributive'), and group as the dependent showed a main effect of sentence type ($F_{1,64}$ = 22.988, p = .000, partial eta-squared = .264, power = .997), no effect of picture type ($F_{1,64}$ = 2.764, p = .101, partial eta-squared = .041, power = .374) and group ($F_{2,64}$ = .383, p = .684, partial eta-squared = .012, power = .109), and a significant interaction of sentence type, picture type, and group ($F_{2,64}$ = 4.050, p = .022, partial eta-squared = .112, power = .702) (see Appendix 15.4 for full results). On percentage of positive scores, a repeated measure of ANOVA testing the two independent variables, sentence type (non-scrambled versus scrambled), picture type ('collective' versus 'distributive'), and group as the dependent showed a main effect of sentence type ($F_{1,64}$ = 20.953, p = .000, partial eta-squared = .247, power = .995), no effect of picture type ($F_{1,64}$ = .453, p = .503, partial eta-squared = .007, power = .102) and group ($F_{2,64}$ = .685, p = .508, partial eta-squared = .021, power = .161), and a significant interaction of picture type and group ($F_{2,64}$ = 6.010, p = .004, partial eta-squared = .158, power = .868), and sentence type, picture type and group ($F_{2,64}$ = 3.829, p = .027, partial eta-squared = .107, power = .675) (see Table 15.7.B in Appendix 15.7 for full results). Statistical analysis indicate the key investigation lies on whether learners are aware of the change of reading as a result of scrambling, thus, the comparison of their acceptance of the 'distributive' pictures associated to non-scrambled and scrambled sentences and rejection of 'collective' pictures associated to scrambled sentence. Figure 16 compares the percentage of positive ratings for 'distributive' pictures in both non-scrambled and scrambled items by all groups.

Figure 16. Percentage of positive rating for ‘distributive’ pictures in the PJT

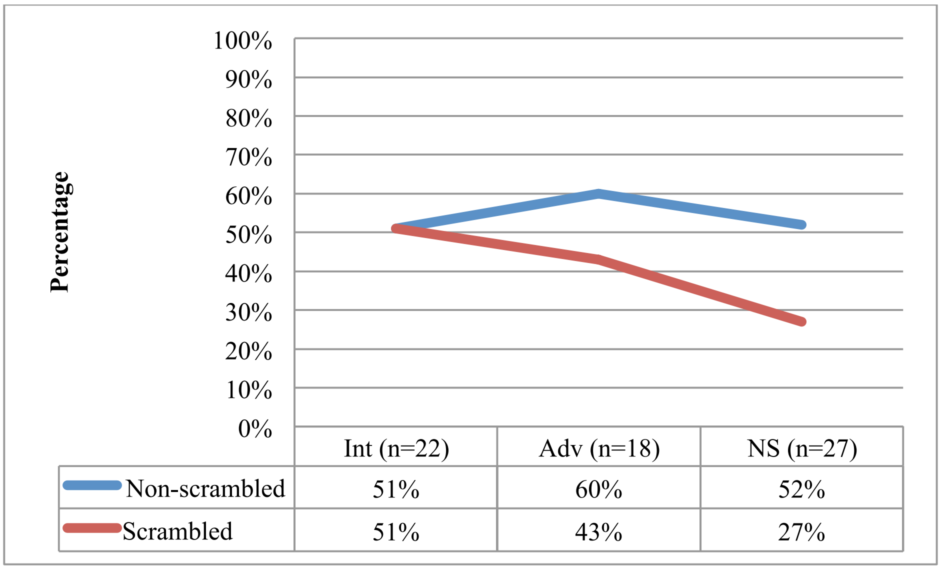


	Int (n=22)	Adv (n=18)	NS (n=27)
Non-scrambled	65%	40%	63%
Scrambled	37%	39%	54%

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

All groups were more likely to accept ‘distributive’ pictures associated to non-scrambled than scrambled sentences. A follow-up repeated measure of ANOVA testing sentence type as the independent variable and group as the dependent showed a main effect of sentence type ($F_{1,64} = 12.402$, $p = .001$, partial eta-squared = .162, power = .934) and group ($F_{2,64} = 4.170$, $p = .020$, partial eta-squared = .115, power = .715), and a significant interaction of sentence type and group ($F_{2,64} = 6.628$, $p = .002$, partial eta-squared = .172, power = .900) (see Appendix 15.10 for full details). A Games-Howell post hoc test indicated a significant difference between NSs and intermediate L2 learners ($p = .011$) in accepting ‘distributive’ pictures associated to the two sentence types. Figure 17 compares the percentage of positive ratings for ‘collective’ pictures in both non-scrambled and scrambled items by all groups.

Figure 17. Percentage of positive rating for ‘collective’ pictures in the PJT



Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced.

While the intermediate L2 learners assigned positive ratings to ‘collective’ pictures at the same rate 51% in both sentence types, the advanced L2 learners and NSs showed a decrease in accepting such pictures from non-scrambled to scrambled sentences at a rate decreasing from 60% to 43% and 52% to 27% respectively. A follow-up repeated measure of ANOVA testing sentence type as the independent variable and group as the dependent showed a main effect of sentence type ($F_{1,64} = 10.839$, $p = .001$, partial eta-squared = .145, power = .900), no effect of group ($F_{2,64} = 2.929$, $p = .061$, partial eta-squared = .084, power = .552), but a significant interaction of sentence type and group ($F_{2,64} = 3.614$, $p = .033$, partial eta-squared = .101, power = .648) (see Appendix 15.11 for full details).

6.6.3. DISCUSSION

The PJT was designed to test learners’ ability to fully acquire correct interpretations in doubly quantified constructions involving a Neg-whQ and a universal quantifier, the change of available readings as a result of scrambling in particular. The distributive plus ‘only a few’ reading represented in ‘distributive’ pictures associated with the scrambled $\forall_{obj}$ $NegQ_{subj}$ V construction is hypothesized to lead to a severe learnability problem, considered a POS problem as discussed in chapter 4. The absence of [Quant:_] feature in learners’ L1 English plays a role in acquiring the change of the reading from a non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V structure to a scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V structure at the syntax-semantics interface. Relevant hypotheses are repeated in (280 – 281).

280. Neg-whQs at the syntax-semantics interface:

EITHER: Failure to add the [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 4: Both groups of learners, regardless of their proficiency level, will associate non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V sentences with both collective and distributive readings, but incorrectly reject the distributive and existential 'only a few' reading and accept the collective reading associated to scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V sentences.

OR: Success in adding [Quant:_] to the Cantonese Neg-whQ feature set.

- HYPOTHESIS 5: Both groups of learners will associate non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V sentences with both collective and distributive readings. However, in scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V sentences, intermediate learners will incorrectly reject the distributive and existential 'only a few' reading and accept the collective reading, whereas advanced learners will do the opposite.

281. HYPOTHESIS 6: Neither the intermediate nor advanced learners will acquire the correct interpretation over scrambled $\forall_{obj}$ Neg-whQ$_{subj}$ V sentences without acquiring the existential reading of Neg-whQs.

The discussion will proceed by considering Hypothesis 4 and 5 together first, then Hypothesis 6 separately. Results in general confirm first part of both hypotheses 5 and 6, that both L2 learner groups associate both 'collective' and 'distributive' pictures with non-scrambled Neg-whQ$_{subj}$ $\forall_{obj}$ V sentences like the NSs did. Statistical analysis did not show any significant difference between the three groups. Hypothesis 4 is confirmed by comparing learners' acceptance of the 'collective' and 'distributive' pictures associated with scrambled sentences, which suggests that there was a failure in adding the [Quant:_] to the Cantonese Neg-whQ feature set. However, Hypothesis 5 is supported by individual results and by comparing, between non-scrambled and scrambled sentences, learners' acceptance of 'distributive' and 'collective' pictures separately, which suggests that adding [Quant:_] to the Cantonese Neg-whQ feature set is more likely to take place with advanced L2 proficiency.

In association with scrambled sentences, both groups of learners failed to reject the collective reading and failed to show a preference of a distributive over a collective reading like the NSs did. The target association with scrambled sentences is the 'distributive' pictures. Most learners failed to disambiguate the two picture types depicting different scope readings by giving similar average ratings to both pictures, when NSs clearly assigned an average rating above 1.5 to 'distributive' pictures and below 1.5 to incorrect 'collective' pictures. In addition, the L2 learners' comparatively lower percentage in positive rating scores for the 'distributive' pictures associated with scrambled sentences indicates low acceptance of the existential reading of a Neg-whQ$_{subj}$. One explanation for this finding may be an L1 effect, since a partial or an existential reading is not available in similar L1 constructions where a $\forall$ precedes a NegQ (e.g. *everybody eats nothing*). Instead, both intermediate and advanced L2 learners showed acceptance by assigning a positive score for incorrect 'collective' pictures at the rate of 43 and 51% respectively, compared to the rate at 27% by the control group. Hypothesis 4 is confirmed. Regardless of their L2 proficiency level, learners in general preferred an absolute negative reading of a 'collective' picture associated with scrambled sentences even though the collective reading is the incorrect reading.

The results did not display an L2 deficit in accepting both the collective and distributive readings for non-scrambled structures; instead they suggested failure to distinguish the two in the scrambled structures. L2 learners' failure to associate a 'distributive' picture with scrambled structures, by assigning negative scores at a rate of above 50%, suggests a deficit in acquiring the existential reading triggered by scrambling of a Neg-whQ. The findings indicates a failure in adding the [Quant:_] feature to the Cantonese feature set of learners' interlanguage grammar, which in turn I have argued to hinder the successful acquisition of Neg-whQs. Despite evidence from the GJT and CJT that advanced L2 learners can acquire syntactic and semantic properties of Neg-whQs, results from the PJT showed that these learners failed to acquire the change of interpretation in required by scrambled doubly quantified constructions. The Cantonese [Quant:_] feature of a {mou {Ø, bingo}} structure, in particular, is problematic for L2 acquisition, hence, the complex morphology of a Neg-whQ represents a 'bottleneck' in Slabakova's terms (2008).

The data supporting Hypothesis 4 appears to support the representational deficit account that there will be a permanent inability to acquire such new functional [Quant:_] feature (Hawkins and Chan, 1997; Hawkins, 2001).[24] However, a statistically significant difference was only found between the NSs and intermediate L2 learners, but not between the NSs and advanced L2 learners, in participants' mean ratings and rate of assigning positive scores of 'collective' pictures. In addition, there are also data that go against the representational deficit approach. Next, Hypothesis 5 supported by one successful case from one advanced learner, who are likely to be a near-native speaker, and by comparing participants' acceptance of 'distributive' and 'collective' pictures between non-scrambled and scrambled sentences.

Table 47. Responses from one advanced L2 learner (Adv06) to scrambled sentences in the PJT

Picture Type									
distributive					collective				
#01	#02	#03	#04	#05	#01	#02	#03	#04	#05
1	1	2	2	1	-2	-1	-1	-2	-1

Note. # = item number.

This particular learner, who also obtained a 100% accuracy rate in the CJT, was 100% accurate at disambiguating the two readings in scrambled constructions. This individual result suggested that while intermediate learners incorrectly rejected 'distributive' pictures, individual Adv06 correctly associated scrambled sentences with these pictures and disassociated scrambled sentence with 'collective' pictures. Notwithstanding, responses from this individual do suggest awareness of the existential interpretation embedded in a Neg-whQ and the change of interpretations as a result of scrambling at an interface level. In addition, the [Quant:_] is successfully added in this individual's Cantonese feature set. Participant Adv 06 is most likely

[24] The representational deficit account is based on developmental data from intermediate or advanced L2 speakers, and evidence for permanent deficit in acquiring new functional features from near-native speakers is not demonstrated.

qualified as a near-native speaker having been living in Hong Kong for 33 years and exposed to L2 Cantonese learning for 35 years by the time the experiment took place. This suggests that being exposed to L2 input is crucial to native-like performance.

Comparing participants' performance between non-scrambled and scrambled sentences, the findings indicate a development trend towards native-like from intermediate to advanced group. Even though all groups tended to accept 'distributive' pictures more readily in non-scrambled than scrambled sentences, the difference of the rates of positive scores is more distinct by intermediate L2 learners than the NSs and advanced L2 learners. Statistical analyses indicate a significant difference between the NSs and intermediate learners, but not between the NSs and advanced learners. In addition, both NSs and advanced L2 group accepted 'collective' pictures more likely in non-scrambled than scrambled sentences, whereas intermediate L2 groups accepted them equally likely in both sentence types. Hypothesis 6 confirms the prediction in different performance between the L2 groups. Results suggest that the 'bottleneck' is more likely to be overcome by learners with advanced L2 proficiency.

Participant Adv 06 was as well one of those showing 100% accuracy in selecting Neg-whQ+$SP_{[+p]}$ constructions as correct response to an existential context in the CJT. Hypothesis 6 is also confirmed, whereby no learners demonstrated acquisition of the change of reading in relations to the scrambled $\forall_{obj}$ Neg-whQ_{subj} V structure without acquiring the additional existential reading of Neg-whQs before hand. In other words, it is necessary for L2 learners to develop competence of the dual interpretation, negative and existential 'only a few' reading, of Neg-whQs at a semantic level before successfully establishing the relation of the change of interpretations in doubly quantified constructions and scrambling at the syntax-semantics interface in L2 acquisition of Cantonese Neg-whQs.

6.7. CONCLUSION

This chapter presented the hypotheses, the method used to collect data, and discussed the findings from the three tasks, namely the grammaticality judgement task (GJT), context-based judgement task (CJT) and picture judgement task (PJT). Findings from the GJT in section 6.4, the CJT in section 6.5 and the PJT in section 6.6 answer the three broad research questions.

The research questions (264 – 266) are repeated in (282 – 284):

282. Can English-speaking learners of Cantonese acquire the syntax and semantics of a Neg-whQ_{obj} construction?

283. Does the absence of a [Quant:_] feature in the learners' L1 English play a role in their acquisition of the dual reading of Cantonese Neg-whQs?

284. Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?

The findings show evidence of an affirmative answers to the three questions. The advanced learner results from the PJT and CJT provided evidence of emerging target-like knowledge of the correct SOV word order of a Neg-whQ_{obj} construction and the existential reading pushed in a Neg-whQ+$SP_{[+p]}$ constructions. In the PJT, advanced L2 learners were achieving target-like in rejecting the ungrammatical SVO word order and accepting the grammatical SOV word order of Neg-whQ_{obj} constructions with nonfinite verbs. In the CJT, individual advance learner results suggested target-like accuracy in selecting Neg-whQ+$SP_{[+p]}$ constructions in existential but not negative contexts. The word order and dual interpretation of Neg-whQ_{obj} constructions are attainable with higher proficiency. Therefore English-speaking learners can acquire the syntax and semantics of a Neg-whQ_{obj} construction. Group results from the CJT and PJT coverage on the prediction that the lack of a [Quant:_] feature in the L1 leads to a delay in the L2 acquisition of Cantonese Neg-whQs. A deficit was found in adult L2 learners of Cantonese's knowledge in associating Neg-whQ+$SP_{[+P]}$ constructions with an existential interpretation. Learners incorrectly selected Neg-whQ+$SP_{[+P]}$ constructions more likely in negative than existential contexts, which is the opposite of the NSs. Results suggest that L2 learners were unaware of the existential reading of Neg-whQ_{obj} construction. Moreover, L2 learners did not show a preference for a 'distributive' picture in relation to scrambled doubly quantified constructions. L2 learners differ from the NSs with respect to rejecting 'collective' pictures associated to scrambled sentences and a significant difference is found between the NSs and intermediate L2 learners. Results strongly suggested L2 learners, even at advanced proficiency level, have not yet added the [Quant:_] features to L2 Neg-whQ feature set and hinder acquisition of the dual interpretation of Neg-whQs. Finally, the delay in acquiring the correct word order, the existential reading at both semantic and interface levels tied to L2 Cantonese Neg-whQs persists into advanced stages of interlanguage development. The Cantonese Neg-whQ$_{obj,}$ which is morphologically more complex than ordinary NegQs and Neg-whQs in English, in particular the unpronounced quantifier operator Ø carrying a [Quant:_] feature, is a 'bottleneck' to adult English learners of Cantonese. Only a handful of results from individual participants were compatible with Slabakova's bottleneck hypothesis (2006, 2008, 2010) and FA (Schwartz and Sprouse, 1996), which suggested that [Quant:_] feature is fully accessible and Neg-whQs are attainable with continuous exposure to L2 input.

CHAPTER 7

CONCLUDING DISCUSSION

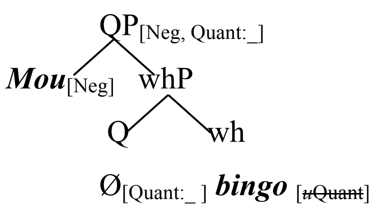
7.1. SUMMARY

This chapter summarises the two chief proposals given in this dissertation, which are the syntactic proposal accounting for the dual interpretation of Cantonese Neg-whQs and the learnability deficit in attaining full interpretations of Neg-whQs at the syntax-semantics interface. This thesis proposes the (Neg-*wh*)QP in explaining the complex morphological structure of a Neg-whQ and attempts to account for the Neg-whQs phenomenon as a type of *wh*-quantifiers in Cantonese. Discussion moved on from the syntactic proposal to the L2 investigation to bridge the key syntactic and semantic properties of Neg-whQs and predicted learnability difficulties. This quantitative and empirical experimental work contributes to the few studies in explaining acquisition of Neg-whQs in English-Cantonese interlanguage. This thesis lays a good foundation for future investigations.

7.1.1. THE SYNTACTIC PROPOSAL FOR CANTONESE NEG-WHQS

A (Neg-*wh*)QP structure is proposed for the morphological complex Neg-whQ as a *wh*-quantifier in Cantonese. This structure was argued to account for the dual interpretation of Neg-whQs and the SOV word order of a Neg-whQ$_{obj}$ construction.

285. (Neg-*wh*)QP:



Two features, [Neg] and [Quant:_] features that are inherited from the negative morpheme in the specifier position and the unpronounced quantifier operator Ø in the head position respectively, were proposed for Neg-whQs. The proposed Neg-whQs, as *wh*-quantifiers, take any *wh*-phrases as complement.

A Neg-whQ$_{obj}$ construction is ambiguous between a negative and existential 'only a few' reading. Its dual interpretation and SOV word order are triggered by syntactic movements and decompositions. A Neg-whQ$_{obj}$ is required to undergo overt movement from its base-generated object position to the spec of vP as one constituent. The movement that is triggered by the feature checking and deletion of [*u*Quant] and EPP features of the probe v by the inherited [Quant:_] feature of Neg-whQ, accounts for the SOV word order in overt syntax. The choice of interpretation is context dependent, as the syntactic proposal of Neg-whQs is based on the existential and negative propositions of *wh*-phrases that are triggered by different licensing contexts.

In the scenario where overt quantifier raising takes place before decomposition, the SOV order at overt syntax and ambiguity is accounted for. Neg-whQ$_{obj,}$ carrying a [Neg] feature, triggers the projection of NegP in derivation and further movement of the Neg-whQ$_{obj}$ to [Spec, NegP] after obligatory movement to [Spec, vP]. The sentential negation interpretation is pushed where the [Quant:_] is valued with a semantic [+Neg] feature. Following the discussion in chapter 2 that *wh*-phrases can be triggered as NWH in pre-modal positions giving a negative reading, then that the existential reading is accounted for under the double negated context after decomposition. Under the assumption of a [$\pm$p] feature related to SPs at the CP, which indicates the presupposition of information shared between the speaker and the addressee, the negative reading is pushed by a sentence-final lowering tone or an SP$_{[-p]}$ and the existential reading is pushed by a sentence-final rising tone or an SP$_{[+p]}$ at a sentence-final position.

In the other scenario where decomposition takes place before overt movement, the Neg-raising gives force to the absolute negative reading where the *wh*-phrase in-situ is licensed as NPI. The proposed structure makes NPIs licensing (interaction with another *wh*-phrase) and WCO cancellation possible in dative and infinitival constructions.

7.1.2. L2 ACQUISITION OF CANTONESE NEG-WHQS

The L2 investigation of the thesis was to answer three research questions, repeated below in (286 – 288).

286. Can English-speaking learners of Cantonese acquire the syntax and semantics of a Neg-whQ$_{obj}$ construction?

287. Does the absence of a [Quant:_] feature in the learners' L1 English play a role in their acquisition of the dual reading of Cantonese Neg-whQs?

288. Is the complex morphology of Neg-whQs a 'bottleneck' in adult L2 acquisition?

Experiments were conducted to investigate L2 acquisition at the English Cantonese interlanguage. The findings of this study affirm the three research questions. In the absence of a one-to-one morphological mapping between English Neg-whQ (e.g. *nowhere*) and Cantonese Neg-whQs (e.g. *mou-matje* 'no-what', *mou-bingo* 'no-who' and *mou-bindou* 'no-where'), hence the absence of a [Quant:_] feature in English learners' L1 grammar, the complex morphology of Cantonese Neg-whQ results in a delay in L2 acquisition of Neg-whQs by adult learners. The functional morphology of Neg-whQs, which involves the quantifier operator Ø carrying the [Quant:_] feature, is proved to be a 'bottleneck' (Slabakova, 2006, 2008, 2010). Individual results indicated successful acquisition and supports FA of Schwartz and Sprouse's (1994, 1996) FT/FA Hypothesis model. The hypotheses were set up to test L2 acquisition of Cantonese Neg-whQs at syntax, semantic, and syntax-semantic interface levels, and the highlights are summarised in (289 – 292).

289. Word order of Neg-whQs:

Intermediate L2 learners will incorrectly reject the grammatical SOV word order of Neg-whQ_{obj} constructions, in particular those with finite verbs, whereas advanced L2 learners will correctly reject the ungrammatical SVO and accept the grammatical SOV word order of Neg-whQ_{obj} constructions regardless of verb finiteness.

290. Semantics of Neg-whQs:

EITHER: Failure to add [Quant:_] to the Cantonese Neg-whQ feature set.

a. L2 learners will incorrectly reject Neg-whQ_{obj}+$SP_{[+p]}$ constructions in existential contexts and accept them only in non-existential contexts.

OR: Success in adding the [Quant:_] to the Cantonese Neg-whQ feature set.

b. Advanced L2 learners will correctly accept Neg-whQ_{obj}+$SP_{[+p]}$ constructions in existential but not non-existential contexts.

291. Neg-whQs at the syntax-semantics interface:

EITHER: Failure to add the [Quant:_] to the Cantonese Neg-whQ feature set.

a. L2 learners will incorrectly reject pictures depicting distributive readings associated to scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences.

OR: Success in adding [Quant:_] to the Cantonese Neg-whQ feature set.

b. Advanced learners will correctly accept pictures depicting distributive readings associated to scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences.

292. No learners will demonstrate the acquisition of correct interpretation over scrambled $\forall_{obj}$ Neg-whQ_{subj} V sentences without acquiring the existential reading of Neg-whQs.

A GJT was conducted to identify whether the absence of overt movement relating to NegQs or Neg-whQs in learners' L1 English had an effect on L2 learners' judgement of the target SOV word order of Neg-whQ_{obj} constructions; a CJT was conducted to test L2 learners' awareness of the existential reading, in addition to the negative reading, of Neg-whQ_{obj} constructions; and a PJT was conducted to investigate the POS problem posed by Neg-whQs in doubly quantified constructions, where a change of interpretation is required when scrambling occurs. Three groups of participants took part in the experiment: native speakers of Cantonese, intermediate and advanced L2 learners with English as their L1.

The general conclusion was, although there is a delay in acquiring the target-like SOV word order of Neg-whQs even at advanced stage of the interlanguage, there is a developmental trend towards native-like judgement from intermediate to advanced L2 proficiency. Evidence for this conclusion comes from the finding that intermediate and advanced L2 learners were generally less accurate in their acceptance of SOV order. Moreover statistics proved a significant difference between these two groups and controls. One crucial finding is that advanced L2 learners demonstrated native-like rejection of the incorrect SVO word order. In contrast, intermediate L2 learners' performances were affected by the finiteness of the verb and intermediate L2 learners were less accurate in consistently rejecting the incorrect SVO order when the verb was marked finite with an aspectual marker. Hypothesis (289) is supported, with the prediction of the different performances between the two learner groups. Overall results from the GJT suggest that the linguistic knowledge tied to overt movement of Cantonese Neg-whQ$_{obj}$ emerges in interlanguage grammar at higher proficiency levels and after substantial L2 input. Thus, the syntax of Neg-whQ constructions is attainable.

Group results from the CJT and PJT in general suggested L1 English learners of Cantonese have not yet added the [Quant:_] feature to their L2 Cantonese Neg-whQ feature set. Hypotheses in (290a) and (291a) were supported. CJT Results showed both intermediate and advanced L2 learner groups were more likely to select Neg-whQ+SP$_{[+P]}$ constructions in negative rather than existential contexts. L2 learners were equally likely to select Neg-whQ+SP$_{[+P]}$ and negative constructions in negative contexts, but they were more likely to select 'only a few' + SP constructions than Neg-whQ+SP$_{[+P]}$ constructions in existential contexts. Intermediate and advanced L2 learners selected Neg-whQ+SP$_{[+P]}$ constructions in existential contexts at a rate no more than 20%, but in negative contexts the rate increased to 50%. Although SPs are absent in L1 English, results suggest that L2 learners had a deficit in acquiring the existential reading of Neg-whQs, but that such deficit did not merely lie in failure in acquiring SPs because L2 learners correctly selected 'only a few' + SP constructions in existential contexts. Results suggested that L2 learners failed to acquire the existential interpretation of Neg-whQ_{obj} constructions and they have not yet added the [Quant:_] feature to the Cantonese Neg-whQ feature set. However, two advanced L2 learners were consistent in selecting Neg-whQ+$SP_{[+P]}$ constructions for existential and not negative contexts. In light of the above, these two individuals' native-like judgement indicated success in adding the [Quant:_] feature to L2 Neg-whQ feature set affirming (290b) and that the semantics of Neg-whQ_{obj} constructions are attainable.

Results from the PJT suggested that L2 learners were, in general more inclined to associate 'distributive' pictures with non-scrambled rather than scrambled sentences involving a Neg-whQ_{subj} and a $\forall_{obj}$. In addition, L2 learners, unlike NSs, did not demonstrate a clear distinction between 'collective' and 'distributive' pictures associated to scrambled sentences. Regardless of proficiency, L1 English learners of Cantonese incorrectly rated a negative score to 'distributive' pictures associated to scrambled sentences. The result suggested L2 learners were unaware of the existential interpretation of Neg-whQs triggered by scrambling. Only one advanced learner who was 100% accurate in accepting 'distributive' pictures and rejecting 'collective' pictures associated to scramble sentences. The Hypothesis in (291b) is only confirmed by one individual result. This participant was also one of the two who performed in a native-like way on the CJT. Thus, results support the claim in (292) that individual L2 competence at the syntactic and semantic levels is required before acquisition of a linguistic phenomenon at a grammatical interface can occur.

To conclude, it is evident that the functional morphology of Cantonese Neg-whQ, the quantifier operator Ø carrying the [Quant:_] feature in particular, is a bottleneck in L2 acquisition of Neg-whQs. L2 learners with advanced Cantonese proficiency correctly rejected the inaccurate SVO word order and acquired the negative reading of Neg-whQs, however, the absence of a one-to-one morphological mapping between English and Cantonese Neg-whQs, and the absence of a [Quant:_] feature in the L1 Neg-whQ feature set delay full acquisition of the existential reading of Cantonese Neg-whQs and the correct interpretation of scrambled doubly quantified constructions involving a Neg-whQ_{subj}. However, individual advanced L1 learners successfully acquired the existential reading of Neg-whQs and an advanced L2 learner even overcame the POS problem and correctly associated the distributive and 'only a few' reading to scrambled doubly quantified sentences. Individual results indicated that native-like competence is attainable with an advanced L2 proficiency and Schwartz and Sprouse's FA (1994, 1996) are supported. In addition, Slabakova's (2008) claim that successful acquisition of comprehension of the form is essential to successful acquisition of meaning was supported.

7.2. LIMITATIONS

This study is limited to small data samples and lacks L2 data collected from near-native L2 learners. L2 data collection was limited to L2 learners with intermediate and advanced proficiency. Regarding the experimental design, the main study was still considered too long involving all together four tasks, even though it was split into two sections. In addition, there were quite a number of participants who withdrew from the second section as a result. The tasks required a lot of reading throughout, and that created processing burden for participants working memory. In future research, perhaps a higher number of shorter sections could be incorporated. Even with careful refinement of prosodic representations in the audio sentences, investigation into the scope interpretation in the PJT suggested a number of questions. For future investigation testing scope interpretation, more careful refinement of the picture drawings is needed. Including written descriptions to the pictures and an acting-out video might be helpful. The previous piloting reflected the burden to participants of a long test, thus the Cantonese proficiency test was designed with only 20 questions. Participants who scored 19 or above were grouped as advanced level, whereas those who scored below 19 were grouped as intermediate level. This should be taken into account, as the proficiency division was indistinct. Moreover, this study was only limited to learners from one L1 group, learners from other L1s should be considered for future investigation.

7.3. FUTURE DIRECTIONS

Overall, this study has provided insight to the little-studied negative *wh*-quantifier (Neg-whQ). There are questions left unanswered. What is a unified account for Cantonese *wh*-elements? Even if learners successfully acquire the implied existential readings, are learners aware in which context the existential reading of a Neg-whQ$_{obj}$ construction is pushed? Full analysis of SPs should be referred back to corresponding literature and further investigation of SPs in relation to Neg-whQs will be beneficial. Although this study has provided some useful data regarding L2 acquisition of Neg-whQs in Cantonese, a number of issues have to be further investigated by re-analysis and refined quantitative experimental work in order to gain a deeper insight. Neg-whQs are phrases that are used in colloquial contexts, therefore experimental works focusing on syntax-discourse phenomena may explain the L2 learners' deficiency in this study, as literature suggests that the syntax-discourse interface is harder to acquire than other interfaces in L2 acquisition (Sorace and Filiaci, 2006; Sorace and Serratrice, 2009). In addition, the current investigation only looks at 'what is difficult' in English Cantonese interlanguage; however, where English Neg-whQs (e.g. *nowhere*) are not ambiguous, future research including L2 learners whose L1 allows ambiguity in terms of form meaning mappings might provide a better understanding about L1 transfer and developmental problems in this respect. Finally, future research could usefully follow the recent suggestion by Whong *et al.* (2014) to bring theoretical SLA research to the classroom, and investigate whether explicit instruction on Neg-whQs could facilitate acquisition of the different interpretations of this form.

Appendices

Appendix 1: Sentences tested in the (pre-) pilot study

1.1. Nonfinite mono-clausal sentences

1. Andrea mou-bingo soeng gin (Andrea 無邊個想見。)
   Andrea nobody want to meet
2. *Andrea soeng gin mou-bingo (Andrea 想見無邊個。)
   Andrea want to meet nobody
3. Andrea soeng gin ngo (Andrea 想見我。)
   Andrea want to meet me
4. James mou-matje zungji (James 無乜野鍾意。)
   James nothing like
5. *James zungji mou-matje (James 鍾意無乜野。)
   James like nothing
6. *James cin zungji (James 錢鍾意。)
   James money like
7. Antony mou-bindou hui (Antony 無邊度去。)
   Antony nowhere go
8. *Antony hui mou-bindou (Antony 去無邊度。)
   Antony go nowhere
9. Antony hui luihan (Antony 去旅行。)
   Antony go trip

1.2. Finite mono-clausal sentences

10. Mary mou-bingo zungji-guo (Mary 無邊個鍾意過。)
    Mary nobody like-ASP
11. *Mary zungji-guo mou-bingo (Mary 鍾意過無邊個。)
    Mary like-ASP nobody
12. *Mary zungji-guo mou-jan (Mary 鍾意過無人。)
    Mary like-ASP nobody
13. Matthew mou-matje sik-zo (Matthew 無乜野食左。)
    Matthew nothing eat-ASP

14. *Matthew sik-zo mou-matje (Matthew 食左無乜野。)
Matthew eat-ASP nothing
15. Matthew mou-je sik-zo (Matthew 無野食左。)
Matthew nothing eat-ASP
16. Margret mou-bindou hui-guo (Margret 無邊度去過。)
Margret nowhere go-ASP
17. *Margret hui-guo mou-bindou (Margret 去過無邊度。)
Margret go-ASP nowhere
18. *Margret hui-guo mou-deifong (Margret 去過無地方。)
Margret go-ASP no-place

1.3. Non-finite bi-clausal sentences

19. Kitty mou-bingo jingwaai Sandy toujim (Kitty 無邊個認為 Sandy 討厭。)
Kitty nobody think Sandy hate
20. *Kitty jingwaai Sandy toujim mou-bingo (Kitty 認為 Sandy 討厭無邊個。)
Kitty think Sandy hate nobody
21. *Kitty ngo jingwaai Sandy toujim (Kitty 我認為 Sandy 討厭。)
Kitty me think Sandy hate
22. Jane mou-bindou waa Ivy jiu hui (Jane 無邊度話 Ivy 要去。)
Jane nowhere say Ivy has to go
23. Jane waa Ivy jiu hui mou-bindou (Jane 話 Ivy 要去無邊度。)
Jane say Ivy has to go nowhere
24. *Jane nganhong waa Ivy jiu hui (Jane 銀行話 Ivy 要去。)
Jane bank say Ivy has to go
25. Ken mou-matje jingwaai Kate soeng jam (Ken 無乜野認為 Kate 想飲。)
Ken nothing think Kate want to drink
26. *Ken jingwaai Kate soeng jam mou-matje (Ken 認為 Kate 想飲無乜野。)
Ken think Kate want to drink nothing
27. Ken jingwaai Kate soeng jam holok (Ken 認為 Kate 想飲可樂。)
Ken think Kate want to drink coke

1.4. Finite Bi-clausal sentences

28. Brian waa Joy mou-matje maai-zo (Brian 話 Joy 無乜野買左。)
Brian say Joy nothing buy-ASP
29. *Brian mou-matje waa Joy maai-zo (Brian 無乜野話 Joy 買左。)
Brian nothing say Joy buy-ASP
30. *Brian mou-jesik waa Joy maai-zo (Brian 無點心話 Joy 買左。)
Brian no-food say Joy buy-ASP

31. Joe waa Peggy mou-bindou hui-guo (Joe 話 Peggy 無邊度去過。)
Joe say Peggy nowhere go-ASP
32. *Joe mou-bindou waa Peggy hui-guo (Joe 無邊度話 Peggy 去過。)
Joe nowhere say Peggy go-ASP
33. Joe waa Peggy mou-deifong hui-guo (Joe 話 Peggy 無地方去過。)
Joe say Peggy no-place go-ASP
34. Pat waa Anna mou-bingo joek-zo (Pat 認為 Anna 無邊個約左。)
Pat say Anna nobody date-ASP
35. *Pat mou-bingo waa Anna joek-zo (Pat 無邊個認為 Anna 約左。)
Pat nobody say Anna date-ASP
36. *Pat mou-pengjau waa Anna joek-zo (Pat 無朋友認為 Anna 約左。)
Pat no-friends say Anna date-ASP

Appendix 2: Results of the (pre-) pilot study

Table 2.A: Summary of the mean rating and accuracy rate of the (pre-) pilot study – Part One

		Part One				
		NonFinite		Finite		Distracter
Natives (n=10)		Mono-clausal	Bi-clausal	Mon-clausal	Bi-clausal	D
Good	Mean	1.3	-1.23	0.47	-0.3	1.28
	Accuracy	0.87	0.17	0.6	0.43	0.86
Bad	Mean	-1.67	-1.7	-1.37	-1.7	-1.51
	Accuracy	1	0.9	0.93	0.97	0.9
Beginners (n=5)						
Good	Mean	-0.07	-1.2	-0.53	-0.2	0.79
	Accuracy	0.33	0.67	0.33	0.33	0.64
Bad	Mean	-0.8	-0.2	0.27	-0.53	-0.74
	Accuracy	0.67	0.33	0.33	0.53	0.51
Advanced (n=5)						
Good	Mean	0.03	-0.9	0.23	0.43	1.37
	Accuracy	0.4	0.07	0.47	0.67	0.88
Bad	Mean	-1.07	0	-0.67	-0.57	-0.56
	Accuracy	0.87	0.47	0.73	0.47	0.57

Note. Good = Grammatical SOV sentences; Bad = Ungrammatical SVO sentences

Table 2.B: Summary of the mean rating and accuracy rate of the (pre-) pilot study – Part Two

		Part Two		
Natives (n=10)		Collective	Distributive	Distractor
Good	Mean	-0.12	0.37	1.4
	Accuracy	0.43	0.63	0.85
Bad	Mean	0	-0.45	1.1
	Accuracy	0.5	0.55	0.18
Beginners (n=5)				
Good	Mean	-0.25	1.13	0.79
	Accuracy	0.27	0.47	0.55
Bad	Mean	0.67	1.5	0.66
	Accuracy	0.1	0	0.17
Advanced (n=5)				
Good	Mean	0.67	1.8	0.5
	Accuracy	0.4	0.87	0.65
Bad	Mean	0.9	1.8	1.37
	Accuracy	0.2	0	0.17

Note. Good = The picture matches with the sentence interpretation; Bad = The picture does not match with the sentence interpretation

Appendix 3: Preliminary study material

Appendix 3.1: Answer sheet used in the preliminary study

Personal Details

1. Your age:…………………… 2. Gender: M F

3. What is (are) your native language(s)?…………………………...……………

4. What other language(s) can you speak?…………………………...…………..

5. How long have you been learning Cantonese? ....……………

6. How many years (or months) have you lived in Hong Kong, or any other Cantonese-speaking country? ....

Instructions (Task 1)

For each test item you will see and hear the sentence on the screen. Please judge whether the sentence is good, or bad. Indicate your answer by circling one of the options on the scale on your answer sheet. The scale is as follows:

Very bad. Inacceptable.	A bit bad. Not really acceptable.	Fairly good. Acceptable.	Perfectly good. Perfectly acceptable		Can't decide
–2	–1	+1	+2		X

Is the sentence good, or bad?

	Very bad. Inacceptable.	A bit bad. Not really acceptable.	Fairly good. Acceptable.	Perfectly good. Perfectly acceptable		Can't decide
Ex. 1	–2	–1	+1	+2		X
Ex. 2	–2	–1	+1	+2		X
Ex. 3	–2	–1	+1	+2		X
Ex. 4	–2	–1	+1	+2		X

	Very bad. Inacceptable.	A bit bad. Not really acceptable.	Fairly good. Acceptable.	Perfectly good. Perfectly acceptable		Can't decide
Ex. 5	–2	–1	+1	+2		X
Ex. 6	–2	–1	+1	+2		X
Ex. 7	–2	–1	+1	+2		X
Ex. 8	–2	–1	+1	+2		X
Ex. 9	–2	–1	+1	+2		X
Ex. 10	–2	–1	+1	+2		X
Ex. 11	–2	–1	+1	+2		X
Ex. 12	–2	–1	+1	+2		X
Ex. 13	–2	–1	+1	+2		X
Ex. 14	–2	–1	+1	+2		X
Ex. 15	–2	–1	+1	+2		X
Ex. 16	–2	–1	+1	+2		X
Ex. 17	–2	–1	+1	+2		X
Ex. 18	–2	–1	+1	+2		X
Ex. 19	–2	–1	+1	+2		X
Ex. 20	–2	–1	+1	+2		X
Ex. 21	–2	–1	+1	+2		X
Ex. 22	–2	–1	+1	+2		X
Ex. 23	–2	–1	+1	+2		X
Ex. 24	–2	–1	+1	+2		X

Instructions (Task 2)

For each question you will see and hear a paragraph in English on the screen. Please judge whether which sentences that follow best match the given context. Indicate your answer by ticking the box before the sentence on your answer sheet. Please be reminded that you can tick more than one box if appropriate.

Which sentence(s) best match(s) the given context?

	A	B	C	D	E
Ex. 1					
Ex. 2					
Ex. 3					
Ex. 4					
Ex. 5					
Ex. 6					
Ex. 7					
Ex. 8					
Ex. 9					
Ex. 10					
Ex. 11					
Ex. 12					

Instructions (Task 3)

For each test item you will see a picture. Underneath the picture, a sentence will be displayed and read. Please judge whether the answer is possible, or strange, in the context of the picture and the sentence. Indicate your answer by circling one of the options on the scale on your answer sheet. The scale is as follows:

Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
–2	–1	+1	+2		X

Is the sentence good, or strange, in the context of the picture?

	Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
Ex. 1	–2	–1	+1	+2		X
Ex. 2	–2	–1	+1	+2		X
Ex. 3	–2	–1	+1	+2		X
Ex. 4	–2	–1	+1	+2		X
Ex. 5	–2	–1	+1	+2		X
Ex. 6	–2	–1	+1	+2		X
Ex. 7	–2	–1	+1	+2		X
Ex. 8	–2	–1	+1	+2		X
Ex. 9	–2	–1	+1	+2		X
Ex. 10	–2	–1	+1	+2		X
Ex. 11	–2	–1	+1	+2		X
Ex. 12	–2	–1	+1	+2		X
Ex. 13	–2	–1	+1	+2		X

	Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
Ex. 14	–2	–1	+1	+2		X
Ex. 15	–2	–1	+1	+2		X
Ex. 16	–2	–1	+1	+2		X
Ex. 17	–2	–1	+1	+2		X
Ex. 18	–2	–1	+1	+2		X
Ex. 19	–2	–1	+1	+2		X
Ex. 20	–2	–1	+1	+2		X

Appendix 3.2: Preliminary Study – Personal Details for Cantonese native speakers

1. Your age:……………………   2. Gender: M F
3. What other language(s) can you speak?……………………………..…………..
4. Describe your occupation and education background? ....

....

5. How many years (or months) have you lived in Hong Kong, or any other

Cantonese-speaking country? ....

Appendix 4: Test sentences in the preliminary study

Appendix 4.1: Test sentences used in the GJT (24)

Note. G = grammatical sentences/ matching sentence-picture; B = ungrammatical sentences/ mismatching sentence-picture; C_{NP} = controls with referential NP; C_{NegQ} = controls with ordinary NegQ; NonFin = Non-finite experimental items; Fin = Finite experimental items; NEG = experimental items with negative context; EX = experimental items with existential context; NegQ>Num = distractors where $NegQ_{subj}$ precedes Num_{obj}; Num > NegQ = distractors where Num_{obj} precedes $NegQ_{subj}$; Neg-whQ>∀ = experimental items with a non-scrambled structure where Neg-whQ_{subj} precedes $\forall_{obj}$; ∀>Neg-whQ = experimental items with a non-scrambled structure where $\forall_{obj}$ precedes Neg-whQ_{subj}.

Instructions:

For each test item you will see and hear the sentence on the screen. Please judge whether the sentence is good, or bad. Indicate your answer by circling one of the options on the scale on your answer sheet.

Example i) This is a good sentence.

Example ii) This sentence is badder.

Order	Code	Test sentence (English and Cantonese versions)
1	C_{NegQ}03.B	Mary zungji-guo mou-jan (Mary 鍾意過無人。) Mary like-ASP nobody
2	Fin01.G	Mary mou-bingo zungji-guo (Mary 無邊個鍾意過。) Mary no-who like-ASP
3	Fin03.G	Mary zungji-guo mou-bingo (Mary 鍾意過無邊個。) Mary like-ASP no-who
4	NonFin01.G	Andrea mou-bingo soeng gin (Andrea 無邊個想見。) Andrea no-who want to meet
5	NonFin01.B	James zungji mou-matje (James 鍾意無乜野。) James like no-what
6	C_{NP}04.B	Ophelia lengdeng hui (Ophelia 倫敦去。) Ophelia London go
7	C_{NP}01.G	Andrea taaitsiu ngo wo (Andrea 睇小我喎。) Andrea look down on me SP
8	Fin02.G	Margret mou-bindou hui-guo wo (Margret 無邊度去過喎。) Margret no-where go-ASP SP
9	NonFin04.B	Mary zungji sik mou-matje (Mary 鍾意食無乜野。) Mary like to eat no-what
10	C_{NegQ}02.B	Margret hui-guo mou-deifong (Margret 去過無地方。) Margret go-ASP nowhere
11	Fin01.B	Margret hui-guo mou-bindou (Margret 去過無邊度◦) Margret go-ASP no-where

12	NonFin03.G	Antony mou-bindou soeng hui gaa (Antony 無邊度想去架。) Antony no-where want to go SP
13	F03.G	Matthew mou-matje sik-zo (Matthew 無乜野食左。) Matthew no-what eat-ASP
14	C_{NegQ}02.G	Matthew mou-je sik-guo (Matthew 無野食過。) Matthew nothing eat-ASP
15	NonFin03.B	Andrea soeng gin mou-bingo (Andrea 想見無邊個。) Andrea want to meet no-who
16	Fin04.B	David soenghoi-guo mou-bingo (David 傷害過無邊個。) David hurt-ASP no-who
17	C_{NP}01.B	James cin zungji (James 錢鍾意。) James money likes
18	C_{NegQ}04.G	Stephen mou-jan soeng gin (Stephen 無人想見。) Stephen nobody want to meet
19	NonFin02.G	James mou-matje zungji wo (James 無乜野鍾意喎。) James no-what like SP
20	Fin04.G	David mou-bingo soenghoi-guo (David 無邊個傷害過。) David no-who hurt-ASP
21	C_{NP}03.G	Antony soeng hui luihan (Antony 想去旅行。) Antony want to go travel
22	NonFin02.B	Antony soeng hui mou-bindou (Antony 想去無邊度。) Antony want to go no-where
23	Fin02.B	Matthew sik-zo mou-matje (Matthew 食左無乜野。) Matthew eat-ASP no-who
24	NonFin04.G	Mary mou-matje zungji sik (Mary 無乜野鍾意食。) Mary no-what like to eat

Appendix 4.2: Test sentences and contexts used in the CJT (9)

Order	Code	Context and Options (English version)
0	Example	Peter is a very lazy boy. He wakes up at noon everyday and does nothing. He never paid attention in class, so he always fails his subjects. Apart from going to school all he does is playing soccer with his friends. When he gets home he just spend the whole night watching TV. His social circle is therefore only limited to his classmates and soccer teammates. I wonder: ☑ A) Peter jiuzou m saai soengtong me? Peter morning doesn't have to go to class Q □ B) Peter zungji sik me aa? Peter likes to eat what Q ☑ C) Peter ge mama m lao kui me? Peter's mother not scold him Q □ D) Peter zungji me aangsik aa? Peter like which colour Q □ E) None of the above.
1	D03	Kit is very considerate and friendly. He has made many good friends, as he has always been treating all his friends genuinely good. Therefore everybody loves him. I wonder: □ A) Kit joek-zo bingo aa? Kit dated who Q □ B) Kit soeng maai matje aa? Kit want to buy what Q □ C) Kit haai-m-haai hou mong le? Kit is-not-is very busy Q □ D) Kit geisi dakhan aa? Kit when have time Q ☑ E) None of the above.
2	NEG02	Mike is a very selfish and self-centered person. He minds his own business only and finds it waste of time to care about others' business, not even his closest family or friends. I wonder: ☑ A) Mike mou-bingo guansam me? Mike no-what care Q □ B) Mike mou guansam bingo aa? Mike no care who Q ☑ C) Mike moujan guansam me? Mike nobody care Q □ D) Mike mou guansam jamhojan a? Mike did not care anyone Q □ E) None of the above.

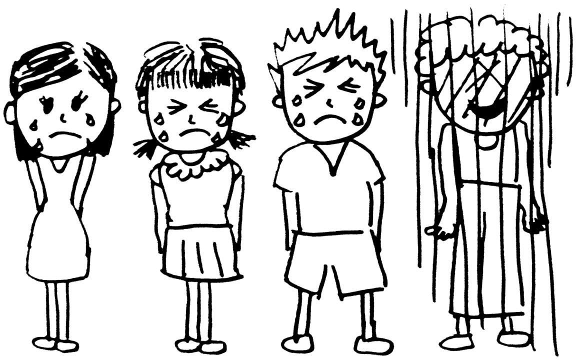
3	EX03	Peter once went to Thai for a relaxing trip because he likes beaches and sunshine. However he is a very boring person and lives a very dull life in the UK. In the weekdays, he goes to work in the early morning and goes home right after work. During the weekends, he simply stays home and only goes out when it is necessary. I wonder: ☑ A) Peter mou-bindou zungji hui me? Peter no-where likes to go Q ☑ B) Peter mou zugji hui bindou aa? Peter no like to go where Q ☑ C) Peter moudeifong zungji hui me? Peter nowhere likes to go Q ☑ D) Peter m zungji hui jamhodeifong a? Peter does not like to go anywhere Q □ E) None of the above.
4	EX02	Kitty feels sick easily if she let her stomach empty while feeling hungry. This afternoon, she just had a tiny cup of yogurt. That was not enough to fill her stomach. She is on the bus to the restaurant and it still takes another 30 minutes before she reaches there. She starts to have gastric distress now. I wonder: ☑ A) Kitty mou-matje sik-guo me? Kitty no-what eat-ASP Q ☑ B) Kitty mou sik-guo matje aa? Kitty no eat-SP what Q ☑ C) Kitty mouje sik-guo me? Kitty nothing eat-ASP Q ☑ D) Kitty mou sik-guo jamhoje a? Kitty did not eat anything Q □ E) None of the above.
5	D01	In the supermarket, there are many kinds of fruits. It includes orange, apple, pineapple, watermelon and kiwi. Jason is a fruits lover. He decides to make a fruit salad with all these tonight and so he buys all of them. I wonder: ☑ A) Jason matje dou soeng sik me? Jason what also wants to buy Q ☑ B) Jason caan tung pingguo dou soeng sik aa? Jason orange and apple also wants to eat Q □ C) Jason soyou deifong dou hui-guo laa? Jason everywhere also go-ASP Q □ D) Jason haai m haai ho you cin? Jason is-not-is very rich Q □ E) None of the above.

6	NEG03	Clara went to Japan, America and Beijing last month. She spent too much money on her trips and becomes sick of travelling for the moment. In the coming few months, she would rather stay in her hometown. I wonder: ☑ A) Clara mou-bindou daasuen hui me? Clara no-where plan to go Q □ B) Clara mou daasuen hui bindou aa? Clara no plan to go where Q ☑ C) Clara moudeifong daasuen hui me? Clara nowhere plan to go Q □ D) Clara mou daasuen hui jamhodeifong a? Clara no plan to go anywhere Q □ E) None of the above.
7	NEG01	Tom ate a lot during the weekend since he had parties with all his friends. But now he has a very poor stomach, and wants to throw up whenever he sees any food. He simply does not want to and so does his stomach cannot afford to EAT.I wonder: ☑ A) Tom mou-matje soeng sik me? Tom no-what wants to eat Q □ B) Tom mou soeng sik matje aa? Tom no want to eat what Q ☑ C) Tom mou-je soeng sik me? Tom nothing want to eat Q □ D) Tom mou soeng sik jamhoje a? Tom does not want to eat anything Q □ E) None of the above
8	EX01	Mary is a very busy person. She works long hours a day. In her spare time, she enjoys being on her own very much except with her very close friends or family. Therefore she is very picky in choosing whom to meet during weekends. Today is Saturday, I wonder: ☑ A) Mary mou-bingo soeng gin me? Mary no-who wants to meet Q ☑ B) Mary mou soeng gin bingo aa? Mary no want to meet what Q ☑ C) Mary moujan soeng gin me? Mary nobody wants to meet Q ☑ D) Mary m soeng gin jamhojan a? Mary does not want to meet anyone Q □ E) None of the above.

9	D02	Michelle's friends suggested planning a trip together one day. One of her friends suggested South Korea, Michelle rejected and claimed that she had been there before; another suggested Taiwan, she rejected again and claimed the same; another suggested Amsterdam, and she gave the same respond. I wonder: ☑ A) Michelle bindou dou hui-guo laa? Michelle where also go-ASP Q ☑ B) Michelle taiguo tung feiloekbang dou hui-guo me? Michelle Thailand and Philippine also go-ASP Q □ C) Michelle soyou je dou soeng sik me? Michelle everything also wants to buy Q □ D) Michelle gamjat sik-guo me aa? Michelle today eat-ASP what Q □ E) None of the above.

Appendix 4.3: Test sentences and pictures used in the PJT (20)

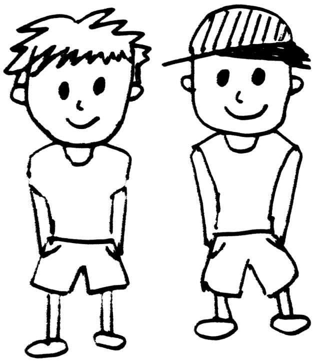
Example i) They are all crying, nobody smiles.



Instruction:

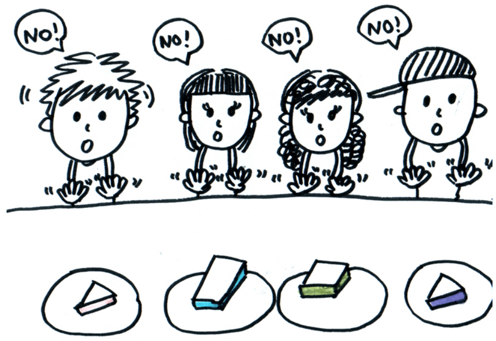
In this picture, all the two girls and the boy are crying. The person smiling has a cross on his face and is under shadow. This indicates that the person who smiles does not exist. So the picture matches with the sentence. So I guess you will choose either 'perfectly good and perfectly possible' or 'fairly good and possible' on the answer sheet. It doesn't actually matter which you pick, so don't feel stressed about deciding between the two. Just go with the one you like or pick 'can't decide' when you cannot decide.

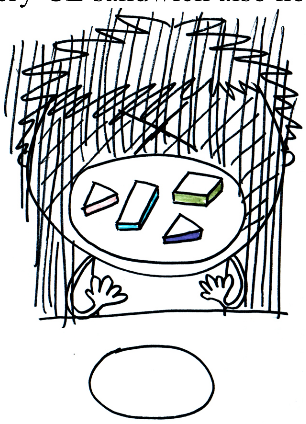
Example ii) The two boys are crying.

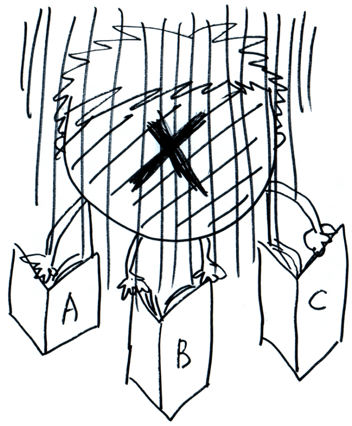
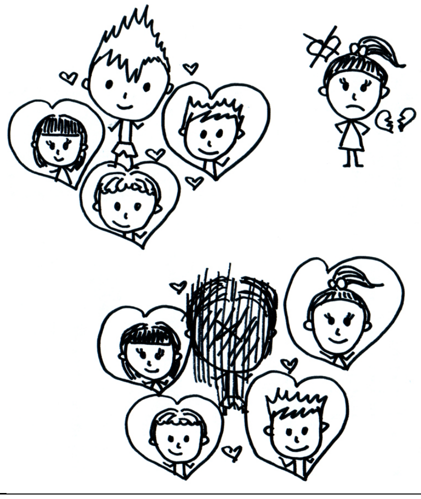


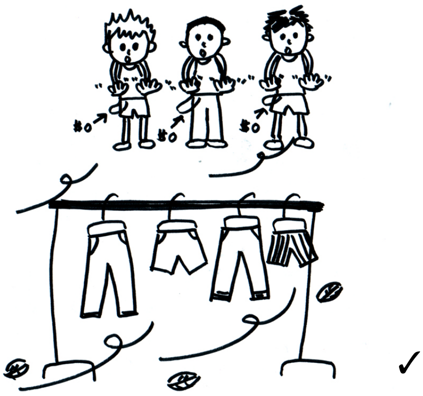
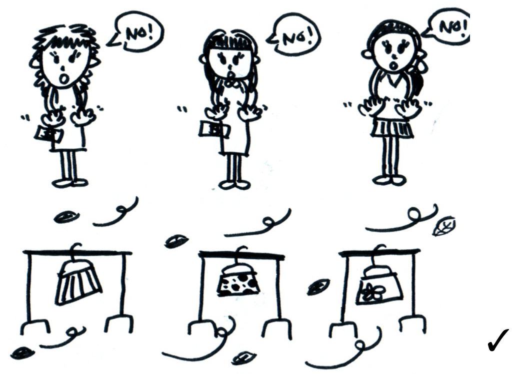
Instructions:

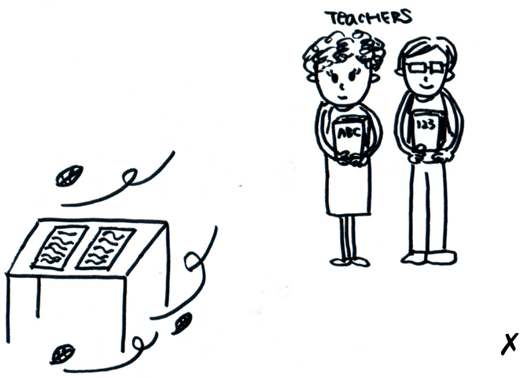
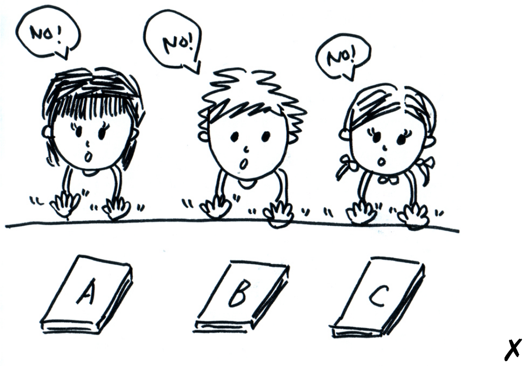
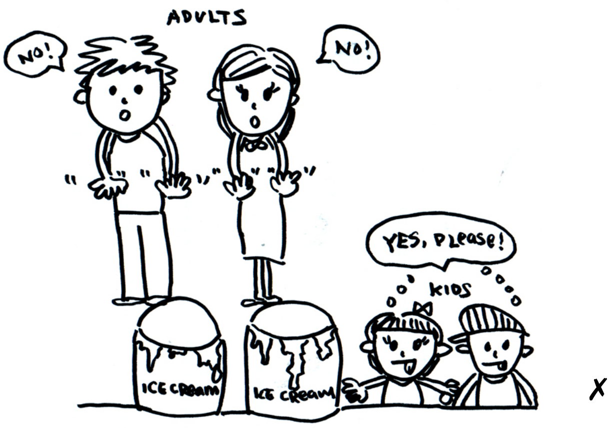
In this picture, the two boys are in fact smiling, so obviously it does not match with the sentence. In this case you'd probably circle either 'a bit strange and not really possible' or 'very strange and impossible'. Again, it doesn't really matter which you pick so just select the one you like or pick 'can't decide' when you cannot decide.

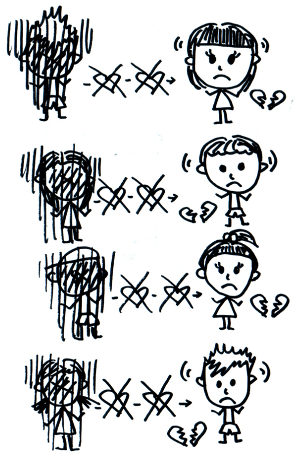
Order	Code	Test sentence and pictures (English and Cantonese versions)
1	Neg-whQ> $\forall$ 01.B	Mou-bingo mui-go saammanzi dou seung sik (無邊個每個三文治都想食。) No-who every-CL sandwich also want to eat  ✗
2	NegQ>Num 03.G	Mou-naamzait maai sei-tiu fu (無男仔買四條褲。) No-boy buy three-CL trousers  ✓

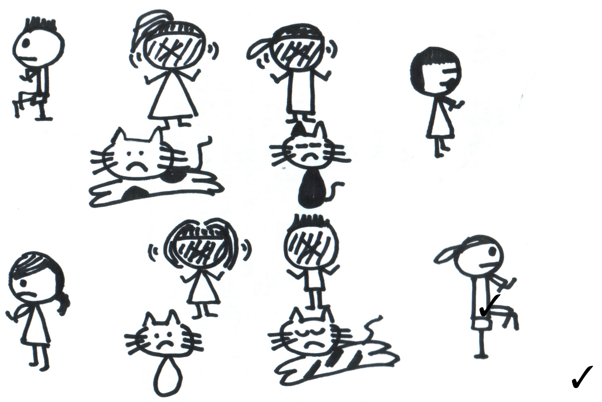
3	∀>Neg-whQ 01.B	Mui-go saammanzi dou mou-bingo seung sik (每個三文治都無邊個想食。) Every-CL sandwich also no-who want to eat  ✗
4	Neg-whQ> ∀03.G	Mou-bingo mui-tiu kuan dou maai (無邊個每條裙都買。) No-who every-CL skirt also buy  ✓
5	Num>NegQ 06.B	Loen-fan mangin dou mou-lousi taai (兩份文件都無老師睇。) Two-CL document also no-teacher read  ✗

6	Num>NegQ 02.G	Saam-gun holok dou mou-siupangjau jam (三罐可樂都無小朋友飲。) Three-CL coke also no-children drink  ✓
7	∀>Neg-whQ 02.B	Mui-buin sju dou mou-bingo seung taai (每本書都無邊個想睇。) Every-CL book also no-who want to read  ✗
8	Neg-whQ>∀ 01.G	Mou-bingo muigojan dou zungji gaze (無邊個每個人都鍾意架遮。) No-who everyone also like SP  ✓

9	Num>NegQ 04.G	Sei-tiu fu dou mou-naamzaai maai (四條褲都無男仔買。) Four-CL trousers also no-boy buy 
10	Num>NegQ 02.B	Saam-zek mao dou mou-jan zungji (三隻貓都無人鍾意。) Three-CL cat also nobody like 
11	∀>Neg-whQ 03.G	Muitiu kuan dou mou-bingo seung maai (每條裙都無邊個想買。) Every-CL skirt also no-who want to buy 

<table>
<tr><td>12</td><td>NegQ>Num
05.B</td><td>Mou-lousi taai loen-fan mangin (無老師睇兩份文件。)
No-teacher read two-CL document

</td></tr>
<tr><td>13</td><td>Neg-whQ>
∀ 02.B</td><td>Mou-bingo mui-buin sju dou taai (無邊個每本書都睇。)
No-who every-CL book also read

</td></tr>
<tr><td>14</td><td>NegQ>Num
03.B</td><td>Mou-daaijan sik loen-bui sjutgo (無大人食兩杯雪糕。)
No-adult eat two-CL ice-cream

</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

15	NegQ>Num 01.B	Mou-jan zungji saam-zek mao (無人鍾意三隻貓。) Nobody like three-CL cat  ✗
16	∀>Neg-whQ 01.G	Muigo-jan dou mou-bingo zungji (每個人都無邊個鍾意。) Everybody also no-who like  ✓
17	Num>NegQ 04.B	Loen-bui sjutgo dou mou-daaijan sik (兩杯雪糕都無大人食。) Two-CL ice-cream also no-adult eat  ✗

18	∀>Neg-whQ 02.G	Muizek mao-dou mou-bingo jyunji gan (每隻貓都無邊個願意跟。) Every cat-also no-who like to follow. 
19	NegQ>Num 01.G	Mou-siupangjau jam saam-gun holok (無小朋友飲三罐可樂。) No-children drink three-CL coke 
20	Neg-whQ> ∀ 02.G	Mou-bingo mui-go pingguo dou seung sik (無邊個每個蘋果都想食。) No-who every-CL apple also want to eat 

Appendix 5: Participants' Details of the preliminary study

Note. NS = Cantonese native speakers; Beg = English speaking learners of Cantonese (Beginners); Adv = English speaking learners of Cantonese (Advanced learners); Missing data is coded as '/'

Table 5.A. Participants' details summary

	Mean age	Years of Learning	Mean Years of Living in HK
NS (n=16)	28.06	N/A	26.69
Beg (n=5)	38.2	<1	11.2
Adv (n=5)	57.4	>2	11.2

Table 5.B. Data on participants of preliminary study

ID	Age	Gender	L2 Language(s)	Occupation/Education	Years Of Living in HK (y;m)
NS01	25	M	English	Finance, F7	25
NS02	24	F	English, Japanese, French, Mandarin	Degree graduate	21
NS03	26	F	English, Mandarin	Degree graduate	26
NS04	25	F	English, Mandarin	Executive Officer, Education Institute, Degree graduate	25
NS05	24	F	English, Spanish	English teacher, Degree graduate	24
NS06	29	F	English	Retention Coordinator, Msc marketing	23
NS07	21	M	English, Mandarin, French	PT Lecturer, MSc in Applied Actuarial Science	18
NS08	24	M	English	Technical Support, Degree graduate	24
NS09	33	M	English, Mandarin	Teacher, Degree graduate	33
NS10	60	M	English, Mandarin, Chiu Chow dialect	Senior Financial Planning	52
NS11	26	F	English, Mandarin	Degree graduate, MA student	26
NS12	29	M	English, Mandarin	Financial Planner, PT degree student	29
NS13	20	F	English, Mandarin	Undergraduate	18
NS14	31	F	English, Mandarin	Physiotherpy, Degree graduate	31
NS15	28	M	English	Accountant, Degree graduate	28
NS16	24	M	English	Degree graduate	24
Beg01	40	F	/	N/A	18;6
Beg02	51	F	/	N/A	24
Beg03	31	F	French	N/A	10
Beg04	35	M	French/Italian/Spanish/German	N/A	1;6
Beg05	34	M	French	N/A	2
Adv01	54	M	French	N/A	18
Adv02	61	M	/	N/A	3
Adv03	53	F	/	N/A	4
Adv04	57	M	/	N/A	29
Adv05	62	F	French	N/A	2

Appendix 6: Results of the PJT – preliminary study

Appendix 6.1: Raw Data

Note. NS = native speakers of Cantonese; Beg = English speaking learners of Cantonese (Beginners); Adv = English speaking learners of Cantonese (Advanced); CNP = controls with referential NP; CNegQ = controls with ordinary NegQ; NonFin = Non-finite experimental items; Fin = Finite experimental items; G = grammatical word order ; B = Ungrammatical word order ; Missing data is coded as '/'.

Table 6.1.A. Raw Data on Control sentences

Code	C_{NP} 01.G	C_{NegQ} 02.G	C_{NP} 03.G	C_{NegQ} 04.G	C_{NP} 01.B	C_{NegQ} 02.B	C_{NegQ} 03.B	C_{NP} 04.B
ID/No	07	14	21	18	17	10	01	06
NS01	2	1	2	2	-1	-1	-2	-1
NS02	2	-1	2	1	-2	-2	-2	-1
NS03	2	2	2	1	-2	-2	-2	-1
NS04	1	1	2	1	-2	-1	-2	-1
NS05	2	1	2	1	-2	-2	-2	-2
NS06	-2	1	2	1	-2	-2	-1	-2
NS07	2	2	2	2	-2	-2	-2	-1
NS08	2	1	2	2	-2	-2	-2	-2
NS09	2	2	2	2	-1	-2	-2	-1
NS10	2	2	2	2	-1	-1	-1	-1
NS11	2	-1	2	2	-2	-1	-1	1
NS12	2	-1	2	1	-2	-2	-1	-2
NS13	2	1	2	2	-2	-2	-2	-2
NS14	2	2	2	2	-2	-2	-2	-2
NS15	2	2	2	2	-2	-2	-2	1
NS16	2	1	2	2	2	-2	-2	-1
Beg01	2	2	2	2	-2	-2	-2	-2
Beg02	2	2	2	2	-2	-2	2	-2
Beg03	x	-1	2	1	-1	-1	-2	-2
Beg04	1	1	1	1	x	-1	1	-1
Beg05	-1	-1	/	1	-1	1	-1	-2
Adv01	1	1	1	1	1	1	1	-1
Adv02	1	2	2	-1	-2	2	-2	-1
Adv03	1	2	2	2	-2	-1	-1	-1
Adv04	1	2	-2	2	1	-1	1	1
Adv05	2	1	2	2	-2	1	1	2

Table 6.1.B. Raw Data on experimental items – Finite type

Code	F01.G	F02.G	F03.G	F04.G	F01.B	F02.B	F03.B	F04.B
ID/No	02	08	13	20	11	23	03	16
NS01	1	1	1	-2	-1	1	-2	-1
NS02	1	2	-2	-2	-2	-2	-2	-2
NS03	-1	1	-2	1	-2	-2	-2	-2
NS04	1	1	1	-1	-2	-2	-2	-2
NS05	-2	-1	-1	-1	-2	1	-1	-1
NS06	1	-1	-1	1	-2	-1	-1	-1
NS07	2	2	-1	-2	-1	1	-2	-2
NS08	2	1	1	-1	-2	2	-2	-2
NS09	-1	-1	2	1	-2	-1	-2	-2
NS10	-1	2	1	1	1	-1	1	1
NS11	1	2	1	1	1	-1	1	1
NS12	1	2	-1	-1	-2	-2	-2	-2
NS13	1	2	1	1	-2	-2	-1	-2
NS14	-1	2	1	-1	-2	-2	-2	-2
NS15	1	2	1	1	-2	-1	-1	-2
NS16	2	1	1	-1	-2	-1	-2	-1
Beg01	2	2	2	2	-2	-2	-2	-2
Beg02	-1	1	2	2	-2	-2	-1	-2
Beg03	-2	-2	-2	1	1	1	-1	1
Beg04	-1	x	1	1	x	1	1	1
Beg05	-2	-1	-1	1	1	1	1	1
Adv01	-1	x	1	1	1	1	-1	1
Adv02	-2	1	2	2	-1	-1	-2	-2
Adv03	-2	2	2	-1	2	-1	2	-2
Adv04	-1	1	2	-1	-1	2	-2	-1
Adv05	-1	-2	2	1	-2	2	-2	1

Table 6.1.C. Raw Data on experimental items – Non-finite type

Code	NonFin 01.G	NonFin 02.G	NonFin 03.G	NonFin 04.G	NonFin 01.B	NonFin 02.B	NonFin 03.B	NonFin 04.B
ID/No	04	19	12	24	05	22	15	09
NS01	2	1	2	2	-1	-1	-2	-1
NS02	1	1	2	1	-2	-2	-2	-2
NS03	1	2	1	2	-2	-2	-2	-2
NS04	1	1	2	2	-2	-1	-1	-2
NS05	1	2	2	1	-2	-2	-1	-2
NS06	1	1	1	2	-2	-1	-2	-2
NS07	2	2	2	2	-1	-2	-2	-2
NS08	2	2	1	2	-2	-2	-2	-2
NS09	2	2	2	2	-1	-2	-2	-2
NS10	1	1	2	2	-	1	1	-1
NS11	2	2	2	2	-1	-1	-1	-1
NS12	1	2	2	2	-1	-1	-2	-2
NS13	1	2	2	2	-2	-2	-2	-2
NS14	1	2	2	2	-2	-2	-2	-2
NS15	2	2	2	2	-1	-1	-2	-1
NS16	2	2	2	2	1	-1	-1	-2
Beg01	2	2	2	2	2	-2	-2	-2
Beg02	-1	2	2	2	1	-2	-2	1
Beg03	-1	-2	-1	-2	2	1	1	-1
Beg04	1	2	1	2	1	1	1	1
Beg05	1	-2	-1	-1	2	/	1	/
Adv01	1	1	1	1	-1	1	1	1
Adv02	-2	2	2	2	2	-1	-2	2
Adv03	-1	-2	2	2	-1	-2	-2	2
Adv04	-1	2	1	1	-2	-1	-1	-1
Adv05	-1	1	2	-2	2	1	-2	2

Appendix 6.2: Repeated measures ANOVA on experimental items (mean rating)

Table 6.2.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
Fin.G	1	.37500	.651920	16
	2	.26660	1.311536	5
	3	.31660	.272585	5
	Total	.34292	.737612	26
Fin.B	1	-1.26563	.823958	16
	2	-.25000	1.500000	5
	3	-.30000	.778621	5
	Total	-.88462	1.051738	26
NonFin.G	1	1.70313	.261705	16
	2	.50000	1.530931	5
	3	.60000	.454148	5
	Total	1.25962	.881705	26
NonFin.B	1	-1.49481	.621662	16
	2	.35000	1.054751	5
	3	-.10000	.858778	5
	Total	-.87181	1.092696	26

Table 6.2.B. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source		Grammaticality	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Finiteness	Linear		3.154	1	3.154	18.286	.000	.443	18.286	.983
Finiteness * Group	Linear		.375	2	.188	1.087	.354	.086	2.175	.217
Error(Finiteness)	Linear		3.968	23	.173					
Grammaticality		Linear	25.155	1	25.155	17.097	.000	.426	17.097	.977
Grammaticality * Group		Linear	23.032	2	11.516	7.827	.003	.405	15.654	.922
Error(Grammaticality)		Linear	33.840	23	1.471					
Finiteness * Grammaticality	Linear	Linear	.877	1	.877	3.877	.061	.144	3.877	.471
Finiteness * Grammaticality * Group	Linear	Linear	4.567	2	2.284	10.088	.001	.467	20.176	.972
Error(Finiteness*Grammaticality)	Linear	Linear	5.206	23	.226					

a. Computed using alpha =

Table 6.2.C. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	.266	1	.266	.369	.550	.016	.369	.090
Group	2.981	2	1.490	2.068	.149	.152	4.137	.381
Error	16.572	23	.721					

a. Computed using alpha =

Appendix 6.3: Repeated measures ANOVA on experimental items (accuracy rates)

Table 6.3.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
Fin.G	1	.64063	.257694	16
	2	.58340	.328105	5
	3	.58340	.117910	5
	Total	.61862	.245150	26
Fin.B	1	.84375	.256174	16
	2	.45000	.512348	5
	3	.60000	.285044	5
	Total	.72115	.348762	26
NonFin.G	1	1.00000	.000000	16
	2	.60000	.454148	5
	3	.70000	.209165	5
	Total	.86538	.266747	26
NonFin.B	1	.94269	.174133	16
	2	.30000	.325960	5
	3	.55000	.325960	5
	Total	.74358	.352722	26

Table 6.3.B. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source	Finiteness	Grammaticality	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Finiteness	Linear		.083	1	.083	2.920	.101	.113	2.920	.374
Finiteness * Group	Linear		.397	2	.198	6.995	.004	.378	13.989	.889
Error(Finiteness)	Linear		.653	23	.028					
Grammaticality		Linear	.096	1	.096	1.154	.294	.048	1.154	.178
Grammaticality * Group		Linear	.340	2	.170	2.047	.152	.151	4.093	.378
Error(Grammaticality)		Linear	1.909	23	.083					
Finiteness * Grammaticality	Linear	Linear	.190	1	.190	6.646	.017	.224	6.646	.695
Finiteness * Grammaticality * Group	Linear	Linear	.014	2	.007	.236	.791	.020	.473	.083
Error(Finiteness *Grammaticality)	Linear	Linear	.659	23	.029					

Table 6.3.C. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	32.835	1	32.835	258.095	.000	.918	258.095	1.000
Group	2.536	2	1.268	9.966	.001	.464	19.932	.970
Error	2.926	23	.127					

a. Computed using alpha =

Table 6.3.D. Between-groups post hoc multiple comparisons (Games-Howell)

MEASURE_1
Games-Howell

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1	2	.37342	.159827	.156	-.18304	.92987
	3	.24842*	.066715	.027	.03778	.45905
2	1	-.37342	.159827	.156	-.92987	.18304
	3	-.12500	.169350	.753	-.66886	.41886
3	1	-.24842*	.066715	.027	-.45905	-.03778
	2	.12500	.169350	.753	-.41886	.66886

Based on observed means.
The error term is Mean Square(Error) = .032.
*. The mean difference is significant at the

Appendix 6.4: Repeated measures ANOVA on experimental items between native speakers and beginners (accuracy rates)

Table 6.4.A. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source		Grammaticality	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Finiteness	Linear		.101	1	.101	4.028	.059	.175	4.028	.478
Finiteness * Group	Linear		.333	1	.333	13.359	.002	.413	13.359	.934
Error(Finiteness)	Linear		.474	19	.025					
Grammaticality		Linear	.079	1	.079	1.000	.330	.050	1.000	.158
Grammaticality * Group		Linear	.320	1	.320	4.056	.058	.176	4.056	.481
Error(Grammaticality)		Linear	1.497	19	.079					
Finiteness * Grammaticality	Linear	Linear	.174	1	.174	5.765	.027	.233	5.765	.625
Finiteness * Grammaticality * Group	Linear	Linear	.008	1	.008	.278	.604	.014	.278	.079
Error(Finiteness*Grammaticality)	Linear	Linear	.572	19	.030					

a. Computed using alpha =

Table 6.4.B. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	27.366	1	27.366	198.259	.000	.913	198.259	1.000
Group	2.125	1	2.125	15.393	.001	.448	15.393	.961
Error	2.623	19	.138					

a. Computed using alpha =

Appendix 6.5: Repeated measures ANOVA on experimental items between native speakers and advanced learners (accuracy rates)

Table 6.5.A. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source		Grammaticality	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Finiteness	Linear		.262	1	.262	9.009	.007	.322	9.009	.812
Finiteness * Group	Linear		.146	1	.146	5.017	.037	.209	5.017	.566
Error(Finiteness)	Linear		.553	19	.029					
Grammaticality		Linear	.000	1	.000	.002	.964	.000	.002	.050
Grammaticality * Group		Linear	.074	1	.074	1.041	.320	.052	1.041	.163
Error(Grammaticality)		Linear	1.355	19	.071					
Finiteness * Grammaticality	Linear	Linear	.174	1	.174	5.765	.027	.233	5.765	.625
Finiteness * Grammaticality * Group	Linear	Linear	.008	1	.008	.278	.604	.014	.278	.079
Error(Finiteness*Grammaticality)	Linear	Linear	.572	19	.030					

a. Computed using alpha =

Table 6.5.B. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	32.710	1	32.710	664.600	.000	.972	664.600	1.000
Group	.940	1	.940	19.106	.000	.501	19.106	.985
Error	.935	19	.049					

a. Computed using alpha =

Appendix 7: Results of the CJT – preliminary study

Appendix 7.1: Raw Data and item analysis of the distractor items

Note. NS = native speakers of Cantonese; Beg = English speaking learners of Cantonese (Beginners); Adv = English speaking learners of Cantonese (Advanced); D = distractor items; EX = experimental items with existential contexts; NEG = experimental items with negative contexts; Missing data is coded as '/'.

Table 7.1.A. Raw Data on all test items

Code	D01	D02	D03	NEG01	NEG02	NEG03	EX01	EX02	EX03
ID/No	205	209	201	207	202	206	208	204	203
Designed options	A/B	A/B	E	B/C/D			A/B/C/D		
NS01	A/B	A	C/D	A/C/D	A/D	A/B/C/D	A/B/C	C/D	A/C/D
NS02	A/B	E	E	E	A/B/D	A/B/C	E	B	A/C
NS03	E	A	E	A/C	D	A/B/C/D	A/C/D	B	A/C
NS04	B	A/B	E	E	D	B	E	B/C	B
NS05	A	E	E	E	B/D	D	E	D	A/C
NS06	D	D	A	D	D	C	E	A	-
NS07	A/B	A/B	A/C	C	B/D	B/D	A/C	C/D	A/C
NS08	A/D	A	E	E	D	E	A/B	A/C/D	A/B/C/D
NS09	A	A	A	A	D	B	A	C	C
NS10	B	E	C/D	A/C	B/D	A/B/D	E	A	E
NS11	A/B/D	A	C/D	A/C/D	A/B/C/D	C/D	A	B	A/C/D
NS12	B	A	E	C	D	D	A	D	C
NS13	D	A	E	A/B/C/D	A/E	B/C	A/B/C	E	A/C/D
NS14	E	A	D	C	C	D	C	E	C
NS15	A	A	C	C	D	E	C	A	D
NS16	A/B	A	E	E	B/D	E	A/C/D	B/C	A/B/C/D
Beg01	A/B	A	E	A/C	C/D	C/D	A/C/D	B/D	D
Beg02	A/B/D	A	C	A/C	A/B/C/D	B/D	A/C/D	A/C/D	A/B/D
Beg03	E	E	C	C	A/B/D	B/D	A/C/D/E	E	A/C/D
Beg04	E	B	E	A/D	B/C	D	A/C/D	E	E
Beg05	E	E	C/D	C	A/B/D	B/D	D	E	A/C/D
Adv01	B	A/B	E	A/B/C/D	A/B/C/D	A/B/C/D	A/B/C/D	A/B/C/D	A/C/D
Adv02	A	B	E	A	A	A/B	A/C	E	A
Adv03	A/B	A/B	A/C/D	A/B/C/D	A/B/C/D	C/D	A/C/D	B	A/D
Adv04	A	A/B	A/D	A/C/D	A/B/C/D	E	D	E	A
Adv05	A/B	A	A/C/D	A/B/C/D	A/C/D	A/B/C/D	B	C	A/B/C/D

Table 7.1.B. Item analysis of the distracter items of the CJT in the preliminary study

Item (Correct options)	Option	NS (n=15)	Beg (n=5)	Adv (n=5)
D01 (A/B)	A	60%	40%	80%
	B	53%	40%	60%
	C	0	0	0
	D	20%	20%	0
	E	13%	60%	0
D02 (A/B)	A	80%	40%	80%
	B	13%	20%	80%
	C	0	0	0
	D	0	0	0
	E	20%	40%	0
D03 (E)	A	13%	0	60%
	B	0	0	0
	C	33%	60%	40%
	D	27%	20%	60%
	E	53%	40%	40%
Correct Selection		87%	60%	100%

Note. Correct Selection = the rate of selecting at least one of the correct options and at least two out of three of the distracter items

Appendix 7.2: Repeated measures ANOVA on experimental items

Note. 1 = Existential contexts; 2 = Negative contexts

Table 7.2.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
A1	Native Cantonese	1.38	.806	16
	L2 beginners	1.60	.894	5
	L2 advanced	1.80	.837	5
	Total	1.50	.812	26
B1	Native Cantonese	.69	.793	16
	L2 beginners	.40	.548	5
	L2 advanced	1.00	1.000	5
	Total	.69	.788	26
C1	Native Cantonese	1.56	.964	16
	L2 beginners	1.40	.548	5
	L2 advanced	1.40	1.140	5
	Total	1.50	.906	26
D1	Native Cantonese	.75	.683	16
	L2 beginners	2.20	.837	5
	L2 advanced	1.40	1.140	5
	Total	1.15	.967	26
E1	Native Cantonese	.38	.619	16
	L2 beginners	1.00	1.000	5
	L2 advanced	.40	.548	5
	Total	.50	.707	26
A2	Native Cantonese	.88	1.088	16
	L2 beginners	1.20	.447	5
	L2 advanced	2.60	.548	5
	Total	1.27	1.116	26
B2	Native Cantonese	.94	.772	16
	L2 beginners	1.40	.894	5
	L2 advanced	1.80	.837	5
	Total	1.19	.849	26
C2	Native Cantonese	1.06	.929	16
	L2 beginners	1.60	.894	5
	L2 advanced	2.20	1.304	5
	Total	1.38	1.061	26
D2	Native Cantonese	1.63	.719	16
	L2 beginners	2.00	.000	5
	L2 advanced	2.20	1.304	5
	Total	1.81	.801	26
E2	Native Cantonese	.56	.727	16
	L2 beginners	.00	.000	5
	L2 advanced	.20	.447	5
	Total	.38	.637	26

Table 7.2.B. Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Context	Sphericity Assumed	1.834	1	1.834	3.385	.079	.128	3.385	.422
Context * Group	Sphericity Assumed	3.490	2	1.745	3.220	.058	.219	6.440	.557
Error(Context)	Sphericity Assumed	12.464	23	.542					
Options	Sphericity Assumed	43.441	4	10.860	17.265	.000	.429	69.062	1.000
Options * Group	Sphericity Assumed	9.684	8	1.210	1.924	.065	.143	15.395	.772
Error(Options)	Sphericity Assumed	57.870	92	.629					
Context * Options	Sphericity Assumed	6.451	4	1.613	3.057	.021	.117	12.229	.788
Context * Options * Group	Sphericity Assumed	9.670	8	1.209	2.291	.028	.166	18.332	.853
Error(Context*Options)	Sphericity Assumed	48.530	92	.527					

a. Computed using alpha =

Table 7.2.C. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	305.881	1	305.881	181.678	.000	.888	181.678	1.000
Group	11.492	2	5.746	3.413	.050	.229	6.825	.583
Error	38.724	23	1.684					

a. Computed using alpha =

Table 7.2.D. Between-groups post hoc multiple comparisons (Games-Howell)

MEASURE_1
Games-Howell

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Native Cantonese	L2 beginners	-.30	.157	.192	-.73	.14
	L2 advanced	-.52	.276	.236	-1.41	.37
L2 beginners	Native Cantonese	.30	.157	.192	-.14	.73
	L2 advanced	-.22	.287	.736	-1.11	.67
L2 advanced	Native Cantonese	.52	.276	.236	-.37	1.41
	L2 beginners	.22	.287	.736	-.67	1.11

Based on observed means.
The error term is Mean Square(Error) = .168.

Appendix 7.3: One-way ANOVA on experimental items

Note. 1 = Existential contexts; 2 = Negative contexts

Table 7.3.A. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
A1	Between Groups	.750	2	.375	.548	.586
	Within Groups	15.750	23	.685		
	Total	16.500	25			
B1	Between Groups	.901	2	.450	.708	.503
	Within Groups	14.638	23	.636		
	Total	15.538	25			
C1	Between Groups	.163	2	.081	.092	.913
	Within Groups	20.338	23	.884		
	Total	20.500	25			
D1	Between Groups	8.385	2	4.192	6.428	.006
	Within Groups	15.000	23	.652		
	Total	23.385	25			
E1	Between Groups	1.550	2	.775	1.628	.218
	Within Groups	10.950	23	.476		
	Total	12.500	25			
A2	Between Groups	11.365	2	5.683	6.618	.005
	Within Groups	19.750	23	.859		
	Total	31.115	25			
B2	Between Groups	3.101	2	1.550	2.387	.114
	Within Groups	14.938	23	.649		
	Total	18.038	25			
C2	Between Groups	5.216	2	2.608	2.615	.095
	Within Groups	22.938	23	.997		
	Total	28.154	25			
D2	Between Groups	1.488	2	.744	1.176	.326
	Within Groups	14.550	23	.633		
	Total	16.038	25			
E2	Between Groups	1.416	2	.708	1.864	.178
	Within Groups	8.738	23	.380		
	Total	10.154	25			

Table 7.3.B. Multiple Comparisons

Games-Howell

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
A1	Native Cantonese	L2 beginners	-.225	.448	.873	-1.59	1.14
		L2 advanced	-.425	.425	.602	-1.70	.85
	L2 beginners	Native Cantonese	.225	.448	.873	-1.14	1.59
		L2 advanced	-.200	.548	.930	-1.77	1.37
	L2 advanced	Native Cantonese	.425	.425	.602	-.85	1.70
		L2 beginners	.200	.548	.930	-1.37	1.77
B1	Native Cantonese	L2 beginners	.288	.315	.645	-.58	1.15
		L2 advanced	-.313	.489	.806	-1.84	1.21
	L2 beginners	Native Cantonese	-.288	.315	.645	-1.15	.58
		L2 advanced	-.600	.510	.506	-2.15	.95
	L2 advanced	Native Cantonese	.313	.489	.806	-1.21	1.84
		L2 beginners	.600	.510	.506	-.95	2.15
C1	Native Cantonese	L2 beginners	.163	.344	.885	-.75	1.08
		L2 advanced	.163	.564	.956	-1.58	1.90
	L2 beginners	Native Cantonese	-.163	.344	.885	-1.08	.75
		L2 advanced	.000	.566	1.000	-1.76	1.76
	L2 advanced	Native Cantonese	-.163	.564	.956	-1.90	1.58
		L2 beginners	.000	.566	1.000	-1.76	1.76
D1	Native Cantonese	L2 beginners	-1.450*	.411	.030	-2.73	-.17
		L2 advanced	-.650	.538	.499	-2.41	1.11
	L2 beginners	Native Cantonese	1.450*	.411	.030	.17	2.73
		L2 advanced	.800	.632	.455	-1.04	2.64
	L2 advanced	Native Cantonese	.650	.538	.499	-1.11	2.41
		L2 beginners	-.800	.632	.455	-2.64	1.04
E1	Native Cantonese	L2 beginners	-.625	.473	.444	-2.17	.92
		L2 advanced	-.025	.290	.996	-.86	.81
	L2 beginners	Native Cantonese	.625	.473	.444	-.92	2.17
		L2 advanced	.600	.510	.506	-.95	2.15

	L2 advanced	Native Cantonese	.025	.290	.996	-.81	.86
		L2 beginners	-.600	.510	.506	-2.15	.95
A2	Native Cantonese	L2 beginners	-.325	.338	.609	-1.19	.54
		L2 advanced	-1.725*	.366	.001	-2.68	-.77
	L2 beginners	Native Cantonese	.325	.338	.609	-.54	1.19
		L2 advanced	-1.400*	.316	.006	-2.31	-.49
	L2 advanced	Native Cantonese	1.725*	.366	.001	.77	2.68
		L2 beginners	1.400*	.316	.006	.49	2.31
B2	Native Cantonese	L2 beginners	-.462	.444	.580	-1.83	.90
		L2 advanced	-.863	.421	.178	-2.14	.41
	L2 beginners	Native Cantonese	.462	.444	.580	-.90	1.83
		L2 advanced	-.400	.548	.753	-1.97	1.17
	L2 advanced	Native Cantonese	.863	.421	.178	-.41	2.14
		L2 beginners	.400	.548	.753	-1.17	1.97
C2	Native Cantonese	L2 beginners	-.538	.462	.510	-1.90	.83
		L2 advanced	-1.138	.628	.253	-3.13	.86
	L2 beginners	Native Cantonese	.538	.462	.510	-.83	1.90
		L2 advanced	-.600	.707	.687	-2.68	1.48
	L2 advanced	Native Cantonese	1.138	.628	.253	-.86	3.13
		L2 beginners	.600	.707	.687	-1.48	2.68
D2	Native Cantonese	L2 beginners	-.375	.180	.126	-.84	.09
		L2 advanced	-.575	.610	.641	-2.59	1.44
	L2 beginners	Native Cantonese	.375	.180	.126	-.09	.84
		L2 advanced	-.200	.583	.938	-2.28	1.88
	L2 advanced	Native Cantonese	.575	.610	.641	-1.44	2.59
		L2 beginners	.200	.583	.938	-1.88	2.28
E2	Native Cantonese	L2 beginners	.563*	.182	.019	.09	1.03
		L2 advanced	.363	.270	.402	-.36	1.09
	L2 beginners	Native Cantonese	-.563*	.182	.019	-1.03	-.09
		L2 advanced	-.200	.200	.615	-.91	.51
	L2 advanced	Native Cantonese	-.363	.270	.402	-1.09	.36
		L2 beginners	.200	.200	.615	-.51	.91

*. The mean difference is significant at the 0.05 level.

Appendix 7.4: Repeated measures ANOVA on option A selections (Beginners versus Advanced learners)

Table 7.4.A. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source	Context	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Context	Linear	.200	1	.200	.800	.397	.091	.800	.124
Context * Group	Linear	1.800	1	1.800	7.200	.028	.474	7.200	.653
Error(Context)	Linear	2.000	8	.250					

a. Computed using alpha =

Table 7.4.B. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	64.800	1	64.800	86.400	.000	.915	86.400	1.000
Group	3.200	1	3.200	4.267	.073	.348	4.267	.444
Error	6.000	8	.750					

a. Computed using alpha =

Appendix 7.5: Repeated measures ANOVA on option A selections (Natives versus Beginners)

Table 7.5.A. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source	Context	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Context	Linear	1.543	1	1.543	2.765	.113	.127	2.765	.352
Context * Group	Linear	.019	1	.019	.034	.855	.002	.034	.054
Error(Context)	Linear	10.600	19	.558					

a. Computed using alpha =

Table 7.5.B. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	48.576	1	48.576	44.160	.000	.699	44.160	1.000
Group	.576	1	.576	.524	.478	.027	.524	.106
Error	20.900	19	1.100					

a. Computed using alpha =

Appendix 7.6: Repeated measures ANOVA on option A selections (Natives versus Advanced learners)

Table 7.6.A. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source	Context	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Context	Linear	.171	1	.171	.286	.599	.015	.286	.080
Context * Group	Linear	3.219	1	3.219	5.365	.032	.220	5.365	.594
Error(Context)	Linear	11.400	19	.600					

a. Computed using alpha =

Table 7.6.B. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	84.233	1	84.233	79.624	.000	.807	79.624	1.000
Group	8.805	1	8.805	8.323	.009	.305	8.323	.781
Error	20.100	19	1.058					

a. Computed using alpha =

Appendix 8: Results of the PJT – preliminary study

Appendix 8.1: Raw Data

Note. NS = native speakers of Cantonese; Beg = English speaking learners of Cantonese (Beginners); Adv = English speaking learners of Cantonese (Advanced); D = distractor items; Neg-whQ>∀ = experimental items with non-scrambled structure where the Neg-whQsubj precedes the ∀obj; ∀>Neg-whQ = experimental items with scrambled structure where the ∀obj precedes the Neg-whQsubj; G = matching sentence-picture matching; B = mismatching sentence-picture; Missing data is coded as '/'.

Table 8.1.A. Raw data on distracters

Code	D01G	D02G	D03G	D04G	D01B	D02B	D03B	D04B	D05B	D06B
ID/No	19	06	02	09	15	10	14	17	12	05
NS01	2	2	2	2	2	1	2	1	1	2
NS02	2	2	1	2	1	2	1	2	-1	2
NS03	1	1	2	2	1	2	1	2	-1	2
NS04	1	1	1	2	2	1	1	-1	2	2
NS05	1	x	2	2	1	2	-1	-1	x	1
NS06	1	1	1	1	1	1	-1	-1	-1	1
NS07	2	1	1	2	1	1	2	2	1	2
NS08	2	2	2	2	2	2	1	2	2	2
NS09	2	2	2	2	2	2	2	1	2	1
NS10	2	-1	1	2	2	2	-1	1	2	2
NS11	2	2	2	2	2	2	2	2	2	2
NS12	2	-2	2	2	1	2	1	1	1	1
NS13	1	2	1	2	1	1	2	-1	1	-1
NS14	2	-2	2	2	2	2	2	2	1	2
NS15	2	-1	2	2	1	2	2	-1	1	1
NS16	2	2	2	2	2	2	-1	2	-1	1
Beg01	2	-2	2	2	2	2	2	2	-2	2
Beg02	x	2	2	2	1	x	2	1	-1	x
Beg03	1	-1	1	1	1	1	1	1	-1	-1
Beg04	2	2	2	2	1	1	2	2	2	1
Beg05	1	-1	1	1	1	1	1	1	-1	-1
Adv01	2	2	2	2	2	2	2	2	1	2
Adv02	2	2	2	2	2	2	2	2	-2	2
Adv03	-2	-2	2	1	-2	2	-2	-2	-2	1
Adv04	2	2	2	2	2	2	2	2	-2	2
Adv05	x	2	1	2	2	1	2	2	1	2

Table 8.1.B. Raw data on experimental items

Code	Neg> ∀01G	Neg> ∀02G	Neg> ∀03G	Neg> ∀01B	Neg> ∀02B	∀ >Neg 01G	∀ >Neg 02G	∀ >Neg 03G	∀ >Neg 02B	∀ >Neg 01B
ID/No	08	20	04	01	13	16	18	11	07	03
NS01	2	-1	1	1	1	1	1	1	1	1
NS02	-1	-1	-1	-1	1	1	-1	1	1	-2
NS03	-2	-1	-1	-2	-1	1	1	1	1	-1
NS04	-2	-1	-1	1	1	-1	1	1	-1	1
NS05	-1	-2	1	x	1	1	-1	1	1	2
NS06	1	-2	-1	1	1	1	1	1	-1	-1
NS07	1	1	1	2	2	2	2	2	1	1
NS08	1	2	2	1	2	x	-1	1	2	2
NS09	1	-2	-2	2	2	1	1	1	1	-1
NS10	2	2	2	1	1	1	1	1	2	2
NS11	2	-1	1	1	2	2	1	1	2	1
NS12	x	x	x	-1	x	1	2	2	1	-2
NS13	2	1	-1	1	2	-2	1	1	-1	-2
NS14	1	-2	1	1	2	2	2	2	2	2
NS15	1	1	-2	-1	1	-1	-1	-2	-1	-2
NS16	-1	x	1	1	2	-1	2	2	1	1
Beg01	2	2	2	2	2	2	2	2	2	2
Beg02	x	-1	x	2	1	x	x	2	x	x
Beg03	/	-1	1	1	1	x	1	1	1	1
Beg04	1	-2	1	2	2	-1	2	1	1	-1
Beg05	x	-1	1	1	1	x	1	1	1	1
Adv01	1	-2	2	2	2	2	2	2	2	2
Adv02	-2	-2	2	2	2	2	2	2	2	2
Adv03	-1	-1	1	2	-2	-1	x	-1	-1	2
Adv04	-2	-2	2	-2	2	2	2	2	2	2
Adv05	x	-1	-2	2	1	1	2	2	-2	x

Appendix 8.2: Repeated measures ANOVA on experimental items

Table 8.2.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
Neg>∀.G	1	.47919	.364607	16
	2	.46660	.380161	5
	3	.33320	.235820	5
	Total	.44869	.339280	26
Neg>∀.B	1	.15625	.301040	16
	2	.00000	.000000	5
	3	.20000	.273861	5
	Total	.13462	.266747	26
∀>Neg.G	1	.79173	.295016	16
	2	.66680	.235820	5
	3	.80000	.447214	5
	Total	.76930	.309403	26
∀>Neg.B	1	.34375	.396600	16
	2	.10000	.223607	5
	3	.20000	.273861	5
	Total	.26923	.353009	26

Table 8.2.B. Tests of Within-Subjects Contrasts

Measure:MEASURE_1

Source		matching	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Reading type	Linear		.868	1	.868	11.068	.003	.325	11.068	.890
Reading type * Group	Linear		.038	2	.019	.244	.786	.021	.488	.084
Error(Reading type)	Linear		1.803	23	.078					
matching		Linear	3.481	1	3.481	18.480	.000	.446	18.480	.984
matching * Group		Linear	.076	2	.038	.201	.819	.017	.402	.078
Error(matching)		Linear	4.332	23	.188					
Reading type * matching	Linear	Linear	.259	1	.259	2.739	.112	.106	2.739	.354
Reading Type * matching * Group	Linear	Linear	.123	2	.061	.649	.532	.053	1.297	.145
Error(Reading type*matching)	Linear	Linear	2.174	23	.095					

a. Computed using alpha =

Table 8.2.C. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	11.129	1	11.129	192.164	.000	.893	192.164	1.000
Group	.287	2	.144	2.481	.106	.177	4.961	.447
Error	1.332	23	.058					

a. Computed using alpha =

Table 8.2.D. Between-groups post hoc multiple comparisons (Games-Howell)

MEASURE_1
Games-Howell

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1	2	.13438	.081790	.309	-.12774	.39650
	3	.05943	.037982	.290	-.03899	.15785
2	1	-.13438	.081790	.309	-.39650	.12774
	3	-.07495	.080178	.645	-.33974	.18984
3	1	-.05943	.037982	.290	-.15785	.03899
	2	.07495	.080178	.645	-.18984	.33974

Based on observed means.
The error term is Mean Square(Error) = .014.

Appendix 9: Cantonese Proficiency Test material

Appendix 9.1: Personal Details (learners) – main study

1. Your age:…………………… 2. Gender: M F
3. What is (are) your native language(s)?…………………………...……………
4. What other language(s) can you speak?…………………………...…………..
5. How long have you been learning Cantonese? ....……………
6. How many years (or months) have you lived in Hong Kong, or any other Cantonese-speaking country? ....

Appendix 9.2: Cantonese Proficiency Test for learners

How well do you understand Cantonese?
This test contains listening questions (Jyutping – the Cantonese phonetic transcriptions are provided for each question) and your test results help assess your Cantonese proficiency level and indicate which group you belong to for the study you participate in (Intermediate – Advanced group).

<u>A. Vocabulary</u>
Choose the correct meaning for each Cantonese phrase in each question:

1. Zou2san4
a. Good morning b. Good-bye

2. Ping4guo2
a. Orange b. Apple

3. Nei5hou2
a. Good-bye b. Hello

4. Gam1jat6
a. Yesterday b. Today

5. Hoi1sam1
a. Happy b. Sad

<u>B. Question and Answer</u>
Choose the correct response for each Cantonese question:

6. Nei5giu3me1mang4aa3?
a. Ngo3sap6syui3.
b. Ngo5giu3Mary.

7. Nei5gam1nin2gei2do1syui3aa3?
a. Ngo3gam1nin2sap6baat3syui3.
b. Ngo3m4sik1nei5gaa3.

8. Nei5hui3bin1aa3?
a. Ngo3hai6dai6hok6sang1.
b. Ngo3fang1hok6aa3.

9. Nei5zung1ji3me1ngan4sik1aa3?
a. Ping4guo2.
b. Hung4sik1.

10. Nei5maai5zo2mat1jie3aa3?
a. Ping4guo2.
b. Hungsik1.

C. Conversation

Listen to the conversation and answer the following questions (in English).

11. Conversation I:

Hawker: Hou2 leng3 saang1guo2. Maai5 di1 la1, siu2ze2.
Carmen: Di1 mong1guo2 dim2 maai6 aa3?
Hawker: Di1 mong1guo2 ng3 man1 jat1 go3.
Carmen: Ngo3 jiu3 sei3 go3.
Hawker: Sei3 go3 mong1guo2, ji6-sap6 man1 la1.
Carmen: Ni1dou6 ji6-sap6 man1.

(a) What fruit did Carmen buy?
____
(b) How many did she buy?
____
(c) How much did she pay for them?
____

12. Conversation II:

Carmen: Lam4 taai2, nei5 gaan1 nguk1 hou2 daai6 wo3.
Mrs. Lam: Haai6 aa3. Ni1 gaan1 nguk1 syun3 gei2 daai6 ga3 la3.
Carmen: Gam2, zung2gung6 jau3 gei2do1 gaan1 fong2 aa3?
Mrs. Lam: Zung2gung6 jau3 sei3 gaan1 fong2.
Carmen: Gam2, nei5dei6 nguk1kei2 zung2gung6 jau3 gei2do1 jan4 aa3?
Mrs. Lam: Zung2gung6 luk6 go3 jan4. Ngo3 tung4 ngo3 sin1saang1 la1, ngo3 ba4-ba1 tung4 ngo3 ma4-ma1 la1, zung3 jau3 ngo3 go3 zai2 Kenny tung4 ngo3 go3 neui2 Angel.
Carmen: Kenny tung4 Angel jau3 gei2 daai6 aa3?
Mrs. Lam: Kenny gam1nin2 baat3 seui3, Angel zau6 cat1 seui3.

(a) How many rooms are there in Mrs. Lam's flat? - ____________________________
(b) How many people live in the flat? Who are they?
____
(c) How old are Mrs. Lam's two children?
____

13. Conversation III:

May: Michelle, nei5 jau3 mou3 heui3-guo3 zung1guok3 aa3?
Michelle: Jau3 aa3, ngo3 heui3-guo3 Zung1guok3 la1.
May: Gam2, nei5 heui3-guo3 gei2-do1 ci3 Zung1guok3 aa3?
Michelle: Ngo3 heui3-guo3 leung3 ci3.
May: Nei5 gei2si4 heui3 gaa3?
Michelle: Ngo3 cin4nin2 heui3-guo3 jat1 ci3, gau6nin2 heui3-guo3 jat1 ci3. Nei5 ne1? Nei5 heui3-guo3 Zung1guok3 mei6 aa3?
May: Ngo3 mei6 heui3-guo3 Zung1guok3, bat1guo3 ngo3 heui3-guo3 Toi4waan1.
Michelle: Nei5 gei2si4 heui3 Toi4waan1 gaa3?
May: Ngo3 seung6 go3 jyut6 heui3 ge3.

(a) How many times has Michelle been to China?
____
(b) When did she go to China?
____
(c) Has May been to China?
____
(d) When did May go to Taiwan?
____

The End

Appendix 10: Main study – materials

Appendix 10.1: Personal Details (Cantonese native speakers) – Main study

1. Your age:…………………… 2. Gender: M F
3. What other language(s) can you speak?…………………………...…………..
4. Describe your occupation and education background? ....

....

5. How many years (or months) have you lived in Hong Kong, or any other

Cantonese-speaking country? ....

Appendix 10.2: Answer sheet used (for all participants) – Main study session 1

Instructions (Task 1)

For each test item you will see and hear the sentence on the screen. Please judge whether the sentence is good, or bad. Indicate your answer by circling one of the options on the scale on your answer sheet. The scale is as follows:

Very bad. Unacceptable.	A bit bad. Not really acceptable.	Fairly good. Acceptable.	Perfectly good. Perfectly acceptable		Can't decide
–2	–1	+1	+2		X

Is the sentence good, or bad?

	Very bad. Unacceptable.	A bit bad. Not really acceptable.	Fairly good. Acceptable.	Perfectly good. Perfectly acceptable		Can't decide
Ex. 1	–2	–1	+1	+2		X
Ex. 2	–2	–1	+1	+2		X
Ex. 3	–2	–1	+1	+2		X
Ex. 4	–2	–1	+1	+2		X
Ex. 5	–2	–1	+1	+2		X
Ex. 6	–2	–1	+1	+2		X
Ex. 7	–2	–1	+1	+2		X
Ex. 8	–2	–1	+1	+2		X
Ex. 9	–2	–1	+1	+2		X
Ex. 10	–2	–1	+1	+2		X
Ex. 11	–2	–1	+1	+2		X
Ex. 12	–2	–1	+1	+2		X

Ex. 13	–2	–1	+1	+2	X
Ex. 14	–2	–1	+1	+2	X
Ex. 15	–2	–1	+1	+2	X
Ex. 16	–2	–1	+1	+2	X
Ex. 17	–2	–1	+1	+2	X
Ex. 18	–2	–1	+1	+2	X
Ex. 19	–2	–1	+1	+2	X
Ex. 20	–2	–1	+1	+2	X
Ex. 21	–2	–1	+1	+2	X
Ex. 22	–2	–1	+1	+2	X
Ex. 23	–2	–1	+1	+2	X
Ex. 24	–2	–1	+1	+2	X
Ex. 25	–2	–1	+1	+2	X
Ex. 26	–2	–1	+1	+2	X
Ex. 27	–2	–1	+1	+2	X
Ex. 28	–2	–1	+1	+2	X
Ex. 29	–2	–1	+1	+2	X
Ex. 30	–2	–1	+1	+2	X
Ex. 31	–2	–1	+1	+2	X
Ex. 32	–2	–1	+1	+2	X
Ex. 33	–2	–1	+1	+2	X
Ex. 34	–2	–1	+1	+2	X
Ex. 35	–2	–1	+1	+2	X
Ex. 36	–2	–1	+1	+2	X

Instructions (Task 2)

For each question you will hear and see a sentence in Cantonese on the screen. Two pictures (A and B) are displayed at the same time with the sentence. Please judge which picture best illustrates the meaning of the given sentence. Please judge whether the answer is possible, or strange, in the context of the picture and the sentence. You are reminded not to give the same score for both pictures (A and B) on your answer sheet. Indicate your answer by circling one of the options on the scale accordingly on your answer sheet. The scale is as follows:

Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
–2	–1	+1	+2		X

Is the sentence good, or strange, in the context of the picture?

		Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
Ex. 1	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 2	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 3	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 4	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 5	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 6	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X

		Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible		Can't decide
Ex. 7	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 8	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 9	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 10	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 11	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 12	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 13	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 14	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 15	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 16	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X
Ex. 17	A	–2	–1	+1	+2		X
	B	–2	–1	+1	+2		X

		Very strange. Impossible.	A bit strange. Not really possible.	Fairly good. Possible.	Perfectly good. Perfectly possible	Can't decide
Ex. 18	A	–2	–1	+1	+2	X
	B	–2	–1	+1	+2	X
Ex. 19	A	–2	–1	+1	+2	X
	B	–2	–1	+1	+2	X
Ex. 20	A	–2	–1	+1	+2	X
	B	–2	–1	+1	+2	X

The End of Session

Appendix 10.3: Answer sheet used (for all participants) – Main study session 2

Instructions (Test 2)

For each question you will see and hear a paragraph in English on the screen. Please judge whether which sentences that follow best match the given context. Indicate your answer by ticking the box before the sentence on your answer sheet. Please be reminded that you can tick more than one box if appropriate.

Which sentence(s) best match(s) the given context?

	A	B	C	D	E
Ex. 1					
Ex. 2					
Ex. 3					
Ex. 4					
Ex. 5					
Ex. 6					
Ex. 7					
Ex. 8					
Ex. 9					
Ex. 10					
Ex. 11					
Ex. 12					
Ex. 13					
Ex. 14					
Ex. 15					
Ex. 16					
Ex. 17					
Ex. 18					

The End of Session 2

Appendix 11: Main study – Materials

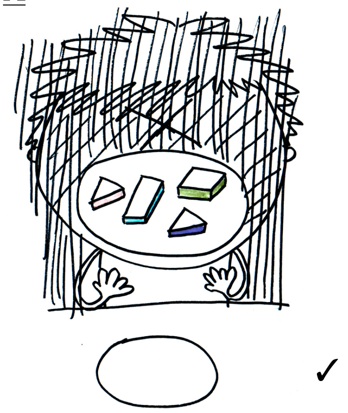
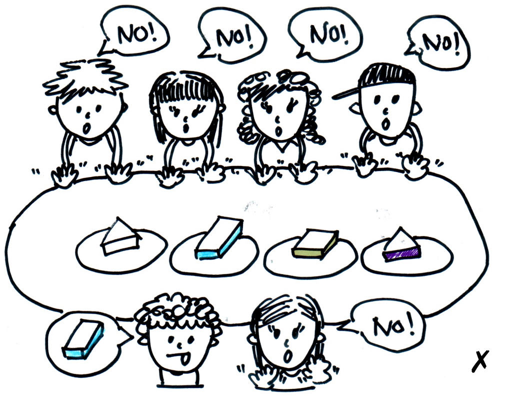
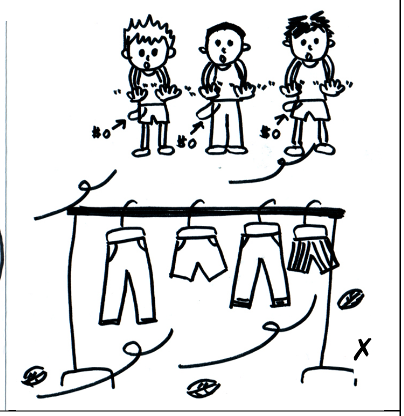
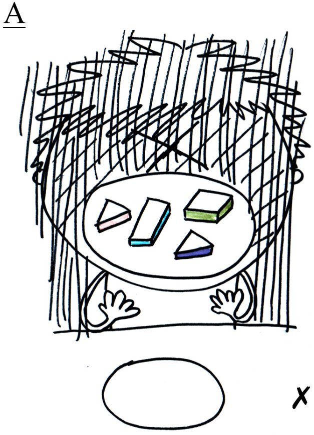
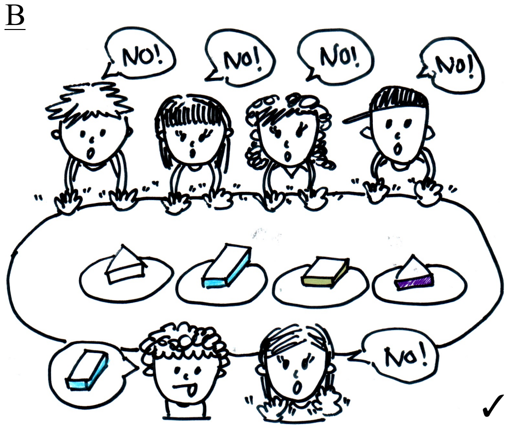
Appendix 11.1: Session 1 Task 1 (GJT)

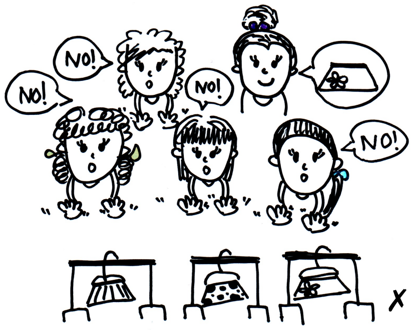
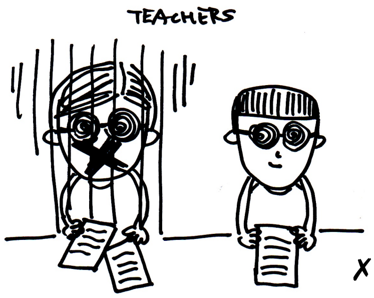
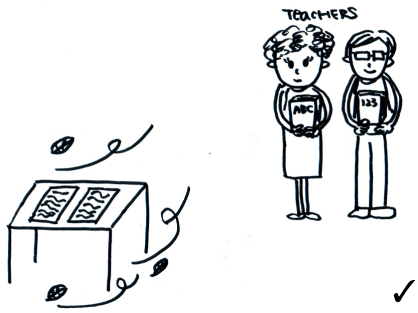
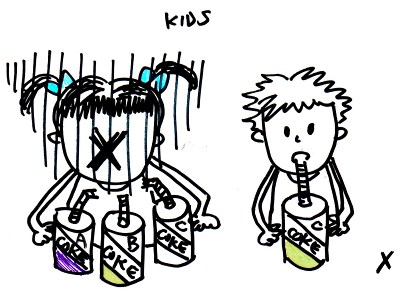
Note. G = grammatical sentences; B = ungrammatical sentences; C_{NP} = controls with referential NP; C_{NegQ} = controls with ordinary NegQ; Fin = finite; NonFin = nonfinite; NEG = experimental items with negative context; EX = experimental items with existential context; NegQ>Num = distractor items where $NegQ_{subj}$ precedes Num_{obj}; Num > NegQ = distractor items where Num_{obj} precedes $NegQ_{subj}$; Neg-whQ>∀ = experimental items with a non-scrambled structure where Neg-whQ_{subj} precedes $\forall_{obj}$; ∀ >Neg-whQ = experimental items with a non-scrambled structure where $\forall_{obj}$ precedes Neg-whQ_{subj}.

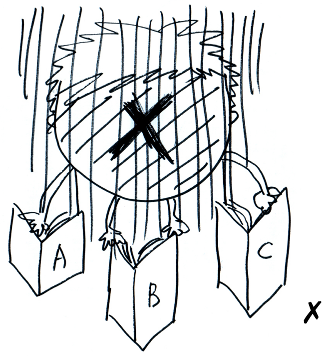
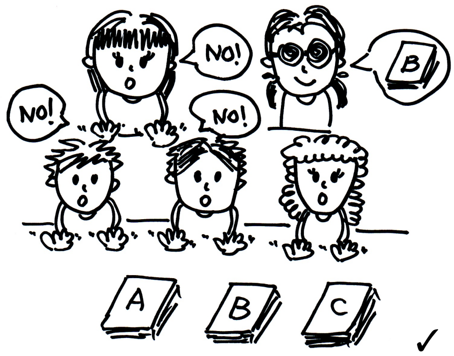
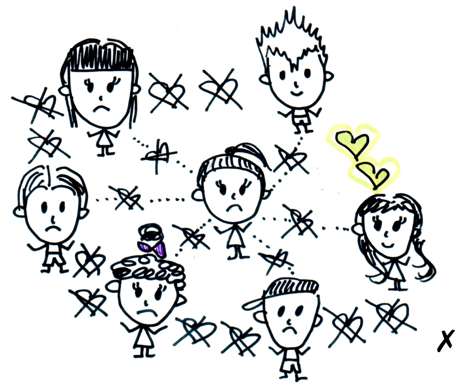
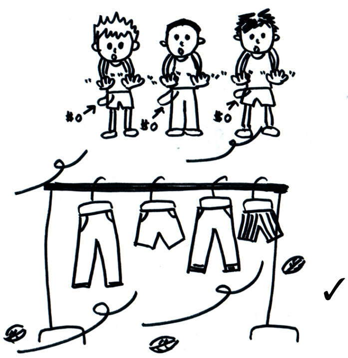
Order	Code	Test sentence (English and Cantonese versions)
1	NonFin03.G	Antony mou-bindou soeng hui (Antony 無邊度想去。) Antony no-where want to go
2	Fin06.B	Kenji zinglaan-zuo mou-matje ze (Kenji 整爛左無乜野遮。) Kenji break-ASP no-what SP
3	C_{NP}01.G	Andrea taaitsiu ngo wo (Andrea 睇小我喎。) Andrea look down on me SP
4	Fin03.B	Mary zungji-guo mou-bingo (Mary 鍾意過無邊個。) Mary like-ASP no-who
5	NonFin05.B	Kit lamzyu joek mou-bingo (Kit 唸住約無邊個。) Kit plan to date no-who
6	NonFin06.G	Thomas mou-bindou gaiwaak hui (Thomas 無邊度計劃去。) Thomas no-where plan to go
7	C_{NP}06.B	Frank Vicky lam-zju joek (Frank Vicky 唸住約。) Frank Vicky plan to date
8	C_{NP}06.G	Winnie tai-guo yi-bun sju (Winnie 睇過依本書。) Winnie read this book
9	Fin03.G	Peter mou-matje sik-zo (Peter 無乜野食左。) Peter no-what eat-ASP
10	NonFin01.B	James zungji mou-matje (James 鍾意無乜野。) James like no-what
11	NonFin05.G	Keith mou-bingo lamzju joek (Keith 無邊個唸住約。) Keith no-who plan to date
12	Fin01.B	Margret hui-guo mou-bindou (Margret 去過無邊度。) Margret go-ASP no-where
13	C_{NP}01.B	James cin zungji (James 錢鍾意。) James money likes
14	C_{NegQ}05.G	Sandy mou-deifong hui-guo (Sandy 無地方去過。) Sandy nowhere go-ASP
15	Fin05.B	Samuel lam-guo hui mou-bindou (Samuel 唸過去無邊度。) Samuel plan-ASP go no-where
16	Fin06.G	Kenji mou-matje zinglaan-zuo ze (Kenji 無乜野整爛左遮。) Kenji no-what break-ASP SP

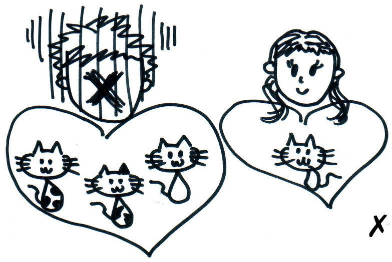
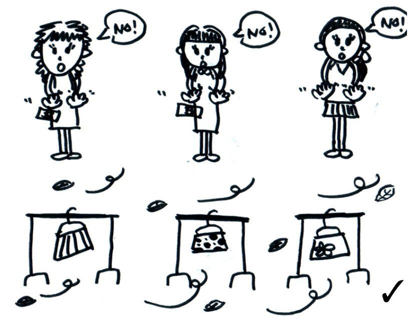
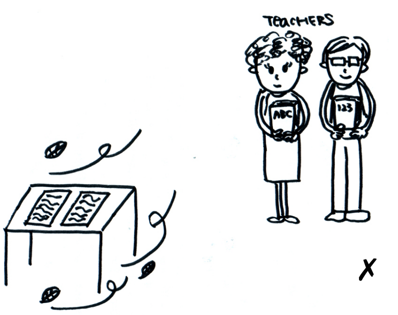
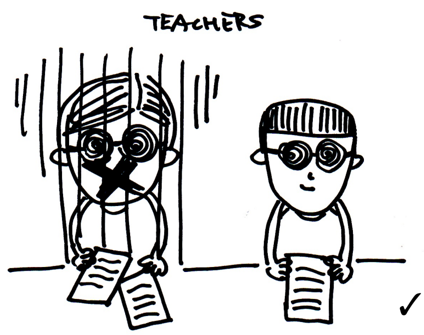
17	NonFin06.B	Lilly gaiwaak hui mou-bindou (Lilly 計劃去無邊度。) Lilly plan go no-where
18	NonFin02.B	Antony soeng hui mou-bindou (Antony 想去無邊度。) Antony want to go no-where
19	NonFin01.G	Andrea mou-bingo soeng gin (Andrea 無邊個想見。) Andrea no-who want to meet
20	C_{NegQ}02.G	Matthew mou-je sik-guo (Matthew 無野食過。) Matthew nothing eat-ASP
21	C_{NegQ}05.B	Luis maai-zo mou-je (Luis 買左無野。) Luis buy-ASP nothing
22	Fin04.B	David soenghoi-guo mou-bingo (David 傷害過無邊個。) David hurt-ASP no-who
23	Fin05.G	Olivia mou-bindou lam-guo hui (Olivia 無邊度唸過去。) Olivia no-where plan-ASP go
24	Fin02.G	Ellen mou-bindou hui-guo wo (Ellen 無邊度去過喎。) Ellen no-where go-ASP SP
25	NonFin04.G	Mary mou-matje m-zungji sik (Mary 無乜野吾鍾意食。) Mary no-what dislike to eat
26	C_{NegQ}03.B	Mary zungji-guo mou-jan (Mary 鍾意過無人。) Mary like-ASP nobody
27	C_{NegQ}04.G	Stephen mou-jan soeng gin (Stephen 無人想見。) Stephen nobody want to meet
28	Fin04.G	Michelle mou-bingo soenghoi-guo (Michelle 無邊個傷害過。) Michelle no-who hurt-ASP
29	NonFin03.B	Andrea soeng gin mou-bingo (Andrea 想見無邊個。) Andrea want to meet no-who
30	C_{NegQ}02.B	Margret hui-guo mou-deifong (Margret 去過無地方。) Margret go-ASP nowhere
31	C_{NP}03.G	Antony soeng hui luihan (Antony 想去旅行。) Antony want to go travel
32	Fin02.B	Matthew sik-zo mou-matje (Matthew 食左無乜野。) Matthew eat-ASP no-what
33	NonFin04.B	Mary zungji sik mou-matje (Mary 鍾意食無乜野。) Mary like to eat no-what
34	NonFin02.G	James mou-matje zungji wo (James 無乜野鍾意喎。) James no-what like SP
35	C_{NP}04.B	Ophelia lengdeng hui (Ophelia 倫敦去。) Ophelia London go
36	Fin01.G	Mary mou-bingo zungji-guo (Mary 無邊個鍾意過。) Mary no-who like-ASP

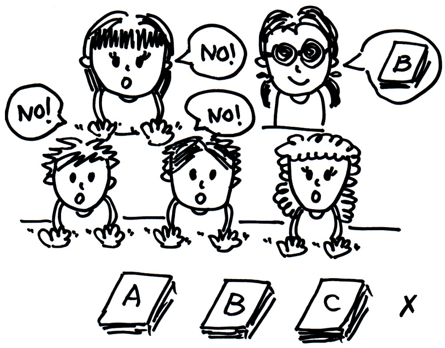
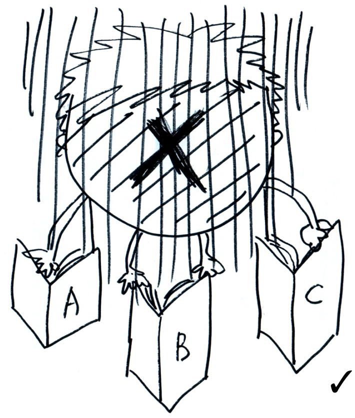
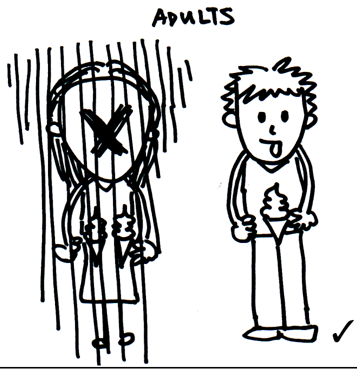
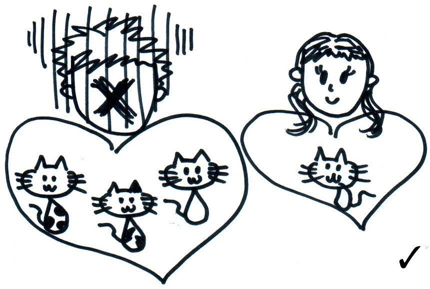
Appendix 11.2: Session 1 Task 2 (PJT)

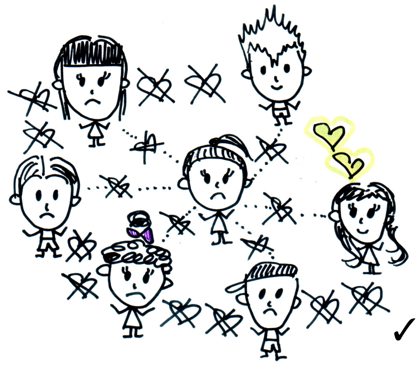
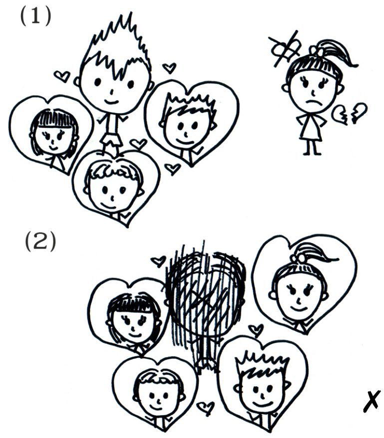
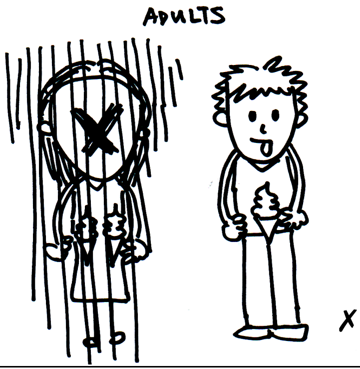
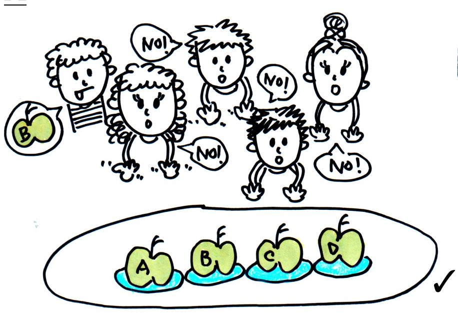
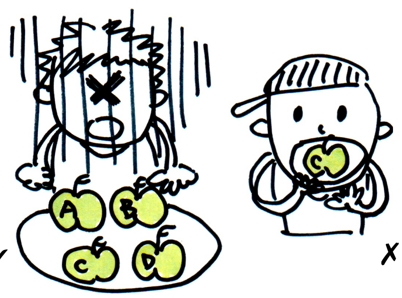
Order	Code	Test sentence and pictures (English and Cantonese versions)
1	Neg-whQ> ∀ 01	Mou-bingo mui-go saammanzi dou seung sik (無邊個每個三文治都想食。) No-who every-CL sandwich also want to eat A  B 
2	NegQ>Num 03	Mou-naamzait maai sei-tiu fu (無男仔買四條褲。) No-boy buy three-CL trousers A  B 
3	∀>Neg-whQ 01	Mui-go saammanzi dou mou-bingo seung sik (每個三文治都無邊個想食。) Every-CL sandwich also no-who want to eat A  B 

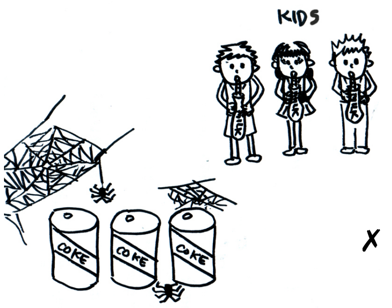
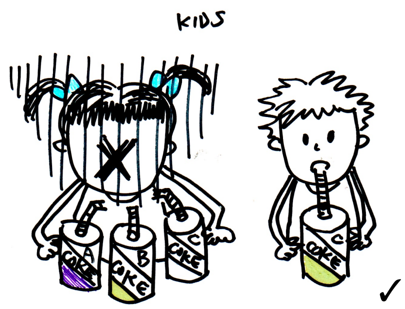
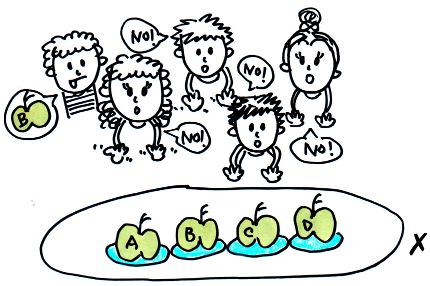
4	Neg-whQ>∀03	Mou-bingo mui-tiu kuan dou maai (無邊個每條裙都買。) No-who every-CL skirt also buy A  B 
5	Num>NegQ 06	Loen-fan mangin dou mou-lousi taai (兩份文件都無老師睇。) Two-CL document also no-teacher read A  B 
6	Num>NegQ 02	Saam-gun holok dou mou-siupangjau jam (三罐可樂都無小朋友飲。) Three-CL coke also no-children drink A  B 

7	∀>Neg-whQ 02	Mui-buin sju dou mou-bingo seung taai (每本書都無邊個想睇。) Every-CL book also no-who want to read <u>A</u>  <u>B</u> 
8	Neg-whQ> ∀ 04	Mou-bingo muigojan dou zungji gaze (無邊個每個人都鍾意架遮。) No-who everyone also like SP <u>A</u>  <u>B</u> 
9	Num>NegQ 04	Sei-tiu fu dou mou-naamzaai maai (四條褲都無男仔買。) Four-CL trousers also no-boy buy <u>A</u>  <u>B</u> 

10	Num>NegQ 05	Saam-zek mao dou mou-jan zungji (三隻貓都無人鍾意。) Three-CL cat also nobody like A  B 
11	∀>Neg-whQ 03	Muitiu kuan dou mou-bingo seung maai (每條裙都無邊個想買。) Every-CL skirt also no-who want to buy A  B 
12	NegQ>Num 07	Mou-lousi taai loen-fan mangin (無老師睇兩份文件。) No-teacher read two-CL document A  B 

13	Neg-whQ>∀ 02	Mou-bingo mui-buin sju dou taai (無邊個每本書都睇。) No-who every-CL book also read A  B 
14	NegQ>Num 08	Mou-daaijan sik loen-bui sjutgo (無大人食兩杯雪糕。) No-adult eat two-CL ice-cream A  B 
15	NegQ>Num 01	Mou-jan zungji saam-zek mao (無人鍾意三隻貓。) Nobody like three-CL cat A  B 

16	∀>Neg-whQ 04	Muigo-jan dou mou-bingo zungji (每個人都無邊個鍾意。) Everybody also no-who like <u>A</u>  <u>B</u> 
17	Num>NegQ 09	Loen-bui sjutgo dou mou-daaijan sik (兩杯雪糕都無大人食。) Two-CL ice-cream also no-adult eat <u>A</u>  <u>B</u> 
18	∀>Neg-whQ 05	Mui-go pingguo dou mou-bingo seung sik (每個蘋果都無邊個想食。) Every-CL apple also no-who want to eat <u>A</u>  <u>B</u> 

19	NegQ>Num 10	Mou-siupangjau jam saam-gun holok (無小朋友飲三罐可樂。) No-children drink three-CL coke A  B 
20	Neg-whQ> ∀ 05	Mou-bingo mui-go pingguo dou seung sik (無邊個每個蘋果都想食。) No-who every-CL apple also want to eat A  B 

Appendix 11.3: Session 2 Task 1 (CJT)

<table>
<tr><th>Order</th><th>Code</th><th>Context and Options (English and Cantonese versions)</th></tr>
<tr><td>1</td><td>EX03</td><td>Peter once went to Thailand for a relaxing trip because he likes beaches and sunshine. That was his only trip abroad. Normally, he is not an adventurous person and he lives a very dull life in the UK. On weekdays, he goes to work in the early morning and comes home right after work. At weekends, he simply stays home and only goes out when it is necessary. I think:
Peter 曾經去過泰國旅行，因為佢好鍾意陽光海灘。個次係佢唯一一次出國旅行。通常，佢吾係一個鍾意冒險既人，0 係英國只係過一 0 的好悶既生活。平日，佢一早返工，放工就即刻返屋企。星期六日，佢通常留 0 係屋企，有特別野先會出去。我認為：
☑ A) Peter mou-bindou zungji hui ze (Peter 無邊度鍾意去遮)
Peter no-where like to go SP
☐ B) Peter mou zungji hui jamho-deifong (Peter 無鍾意去任何地方)
Peter no like to go any place
☐ C) Peter mou-deifong zungji hui gaa (Peter 無地方鍾意去架)
Peter no-place like to go SP
☑ D) Peter zungji hui housiu deifong zaa (Peter 鍾意去好少地方咋)
Peter like to go only a few places SP
☐ E) None of the above.</td></tr>
<tr><td>2</td><td>D01</td><td>In the supermarket, there are many kinds of fruits including oranges, apple, pineapples, watermelons and kiwi. Jason loves fruit. He decides to make a fruit salad with all these tonight and so he buys all of them. I think:
超級市場入面，有好多種水果，包括橙，蘋果，菠蘿，西瓜同埋奇異果。Jason 好鍾意食水果。今晚，佢打算用哂依 d 水果做水果沙律，所以佢全部都買。我認為：
☑ A) Jason zenhaai matje suiguo dou zungji sik wo
(Jason 真係乜野水果都鍾意食喎)
Jason really no-what fruit also like to eat SP
☑ B) Jason hou ginhong (Jason 好健康)
Jason very healthy
☐ C) Jason zenhaai kanlik (Jason 真係勤力)
Jason really hard-working
☐ D) Jason zungji jam holok (Jason 鍾意飲可樂)
Jason like to drink coke
☐ E) None of the above.</td></tr>
</table>

3	NEG04	Dorothy is a shopaholic and has no savings at all. Usually on the last few days of each month, she can hardly afford to buy food and she definitely cannot afford restaurants. It is the last day of the month, and she spent every penny of her salary days ago. I am sure today: *Dorothy 係購物狂，又完全無儲錢。通常每個月最後個幾日，佢都無哂錢食飯，　更加唔可以去餐廳食飯。今日係今個月最後一日，過去幾日佢連一蚊都用淨。我肯定今日：* ☐ A) Dorothy mou-matje maai-guo ze (Dorothy 無乜野買過遮) Dorothy no-what buy-ASP SP ☑ B) Dorothy mou maai-guo jamho-je (Dorothy 無買過任何野) Dorothy no buy-ASP anything ☑ C) Dorothy mou-je maai-guo aa (Dorothy 無野買過呀) Dorothy nothing buy-ASP SP ☐ D) Dorothy maai-guo housiu je zaa (Dorothy 買過好少野咋) Dorothy buy-ASP only a few things SP ☐ E) None of the above
4	EX06	Bus No.10 starts at Aberdeen and terminates at Hong Kong airport. It only stops three places in between, namely Causeway Bay, Wan Chai and Central. I have been waiting for this bus at Wan Chai for five minutes. At last, I see the bus approaching. I expect that: *10 號巴士由香港仔開出，　總站係香港機場。佢中間只係會停 3 個地方，分別係銅鑼灣，灣仔同中環。我 0 係灣仔等緊依架巴士 5 分鐘。最後，我見到架巴士埋緊站。我預計：* ☑ A) Ji gaa baasi mou-bindou ting-guo ze (依架巴士無邊度停過遮) This-CL bus no-where stop-ASP SP ☐ B) Ji gaa baasi mou ting-guo jamho-deifong (依架巴士無停過任何地方) This-CL bus no stop-ASP any-place ☐ C) Ji gaa baasi mou-deifong ting-guo gaa (依架巴士無地方停過架) This-CL bus no-place stop-ASP SP ☑ D) Ji gaa baasi ting-guo housiu deifong zaa (依架巴士停過好少地方咋) This-CL bus stop-ASP only a few places SP ☐ E) None of the above.

5	D02	Patrick's friends suggested planning a trip together one day. One of his friends suggested South Korea. Patrick rejected that idea, saying he had been there before. Another friend suggested Taiwan, but Patrick's response was the same. The next suggestion was Amsterdam, but Patrick gave the same response. I think: *Patrick 0 既朋友提議搵日一齊去旅行。其中一個朋友提議去韓國。Patrick 拒絕依個提議，因為佢之前去過。另外一個朋友提議去臺灣，Patrick 亦因為同一理由拒絕。另一個朋友又提議去荷蘭，佢 0 既反應都係一樣。我認為：* ☑ A) Patrick ji geigo deifong dou hui-guo (Patrick 依幾個地方都去過) Patrick these few places also go-ASP ☐ B) Patrick hou langzaai (Patrick 好靚仔) Patrick very handsome ☑ C) Patrick hou zungji hui leuihang (Patrick 應該好鍾意去旅行) Patrick very like go travel ☐ D) Patrick jau houdo nuipangjau (Patrick 有好多女朋友) Patrick have many girlfriend ☐ E) None of the above.
6	D03	Kim is very considerate and friendly. She has made many good friends, as she has always treated her friends with genuine consideration. Not surprisingly, everybody loves her. I think: *Kim 為人好體諒同埋友善。佢有好多好好 0 既朋友，因為佢都好真心甘對待佢地。所有人都好鍾意佢，真係一 D 都吾出奇。我覺得：* ☐ A) Kim mou pangjau (Kim 無朋友) Kim no friend ☐ B) Kim soeng maai je (Kim 想買野) Kim want to buy things ☐ C) Kim gangpaai hou mong aa (Kim 近排好忙呀) Kim recently very busy SP ☐ D) Kim zungji coenggo (Kim 鍾意唱歌) Kim like singing ☑ E) None of the above.

7	NEG06	Michelle lost her wallet last week. She had a large sum of cash in her wallet because she had just received her salary. Therefore she was flustered and immediately reported missing item at the closest police station right after work. For the whole week, she was upset and worrying about her living expenses for the month. However, she found her wallet right on her desk this morning. I believe: *Michelle 上個禮拜吾見左佢個錢包。佢放左好多現金 0 係個錢包入面，因為佢剛剛出糧。所以佢非常緊張， 當日放工即刻去最近 0 既警局報失。0 個個禮拜，佢都好吾開心，因為佢好憺心 0 個個月 0 既支出。但係， 今朝佢發現個錢包就 0 係佢張書台上面。我相信：* ☐ A) Michelle mou-bindou gimca-guo ze (Michelle 無邊度檢查過遮) Michelle no-where check-ASP SP ☑ B) Michelle mou gimca-guo jamho-deifong aa (Michelle 無檢查過任何地方呀) Michelle no check-ASP any-place SP ☑ C) Michelle moudeifong gimca-guo aa (Michelle 無地方檢查過呀) Michelle no-place check-ASP SP ☐ D) Michelle gimca-guo housiu deifong zaa (Michelle 檢查過好少地方咋) Michelle check-ASP only a few places SP ☐ E) None of the above.
8	D04	Mrs. Fang is very happy with her life. She has a lovely family with her husband and three children. She lives with her family in a house in the countryside with 5 en suite double bedrooms, 2 sitting rooms, 2 dining rooms, a shared washroom, a big kitchen, a garden and a swimming pool. I believe: *Mrs. Fang 好滿意佢宜家 0 既生活。佢有一個幸福 0 既家庭，包括佢老公同三個仔女。佢同佢屋企人住 0 係一間郊外 0 既屋，有 5 間套房，2 個客廳，2 個飯廳，1 個客用洗手間，1 個大廚房，1 個花園同埋 1 個游泳池。我相信：* ☐ A) Mrs. Fang zigei jatgojan zju (Mrs. Fang 自己一個人住) Mr.s Fang self one-person live ☑ B) Mrs. Fang gotdak hou hangfuk (Mrs. Fang 覺得好幸福) Mrs. Fang feel very blissful ☑ C) Mrs. Fang gan nguk hou daai aa (Mrs. Fang 間屋好大呀) Mrs. Fang CL house very big SP ☐ D) Mrs. Fang zungji mao (Mrs. Fang 鍾意貓) Mrs. Fang like cat ☐ E) None of the above.

9	NEG05	Dora is an easy-going and friendly person. She makes many good friends because she always looks so happy. This is due to her always overlooking others' faults, and being forgiving and considerate of different personalities. She doesn't hold any grudges against anybody. I believe: *Dora 係一個好隨和又友善 0 既人。佢有好多好朋友因為佢成日都好開心。最大原因係佢善於忘記人地 0 既過失，大量而且能夠體諒同埋遷就各類性格 0 既人。 佢從來吾記仇。我相信：* ☐ A) Dora mou-bingo lau-guo ze (Dora 無邊個嬲過遮) Dora no-who angry with SP ☑ B) Dora mou lau-guo jamho-jan aa (Dora 無嬲過任何人呀) Dora no angry with any-person SP ☑ C) Dora moujan lau-guo aa (Dora 無人嬲過呀) Dora nobody angry with SP ☐ D) Dora lau-guo housiu jan zaa (Dora 嬲過好少人咋) Dora angry with only a few people SP ☐ E) None of the above
10	EX05	Michelle has to scrimp and save for her tuition fees as a part-time student. For all she earns from her full-time job, she gives one-third to her parents; saves one-third for her tuition fees and spends the rest according to her own needs. She never spends extra unnecessarily. This Saturday, she plans to buy a book and a pen only. I think: *Michelle 係一個 part-time 學生，所以佢要省錢去交學費。佢份正職賺 0 既所有錢，佢會將三分一俾父母；留三分一交學費；其餘三分一用 0 係佢自己 0 既日常生活。佢從來吾會用錢 0 係吾需要 0 既 0 野上面。依個星期六，佢準備去買一本書同埋一枝筆。我唸：* ☑ A) Michelle mou-matje lamju maai ze (Michelle 無乜野唸住買遮) Michelle no-what think buy SP ☐ B) Michelle mou lamju maai jamho-je (Michelle 無唸住買任何野) Michelle no think buy anything ☐ C) Michelle mouje lamju maai gaa (Michelle 無野唸住買架) Michelle nothing think buy SP ☑ D) Michelle lamju maai housiu je zaa (Michelle 唸住買好少野咋) Michelle think buy only a few things SP ☐ E) None of the above.

11	D05	Benjamin loves all kinds of sports. He used to be a member of the basketball team at his university. In his leisure time, he loves to get his friends together and play soccer, basketball or golf. When he goes on a trip, he always picks somewhere where he can go skiing, diving or hiking. I believe: *Benjamin 鍾意所有 0 既運動。佢以前大學係籃球隊 0 既隊員。空閒 0 既時間， 佢鍾意約埋 d 朋友踢波， 打籃球同埋打哥爾夫球。每次去旅行，佢都去 d 可以滑雪，潛水或者行出 0 既地方。我認為：* ☐ A) Benjamin jau leung go neui (Benjamin 有兩個女) Benjamin have two-CL daughter ☑ B) Benjamin hou ginhong (Benjamin 好健康) Benjamin very healthy ☐ C) Benjamin hou zungji dungmat gaa (Benjamin 好鍾意動物架) Benjamin very like animal SP ☑ D) Benjamin ge pangjau dou zungji wandung (Benjamin0 既朋友都鍾意運動) Benjamin GE friend also like exercise ☐ E) None of the above.
12	NEG03	Clara went to Japan, America and Beijing last month. She spent too much money on her trips and has become sick of travelling for the moment. In the coming few months, she would rather stay in her hometown. I believe: *Clara 上個月去左日本，美國同埋北京。佢用左太多錢去旅行，所以開始厭倦去旅行。黎緊幾個月， 佢寧願留 0 係自己國家。我相信：* ☐ A) Clara mou-bindou daasuen hui ze (Clara 無邊度打算去遮) Clara no-where plan to go SP ☑ B) Clara mou daasuen hui jamho-deifong laa (Clara 無打算去任何地方喇) Clara no plan to go any-place SP ☑ C) Clara moudeifong daasuen hui laa (Clara 無地方打算去喇) Clara no-place plan to go SP ☐ D) Clara daasuen hui housiu deifong zaa (Clara 打算去好少地方咋) Clara plan to go only a few places SP ☐ E) None of the above.

13	D06	Frankie went to the supermarket with his girlfriend yesterday because they are planning to prepare a nice dinner for their anniversary. They bought some rib-steaks, vegetables and spaghetti. When they got home, they found that there was no electricity. Frank thought it would be romantic to cook by candlelight, but in the end they messed the kitchen up. Finally they gave up, and decided to go to one of the top restaurants in town instead. I think: *Frankie 琴日同女朋友去超級市場，因為佢地許劃緊為佢地 0 既週年紀念準備一餐好 0 既晚飯。佢地買左 d 牛扒，菜同埋意粉。當佢地返到屋企，佢地發現屋企無電。Frank 原本唸住 0 係燭光下煮飯仲浪漫，點知佢地最後搞到個廚房亂哂都未煮好。結果，佢地都係放棄，最後決定去市中心最頂級 0 既餐廳食算喇。我唸：* ☑ A) Frankie bunloi soeng haai ngukkei zju (Frankie 本來想 0 係屋企煮) Frankie originally want to at home cook ☑ B) Keuidei jatding wui geidak jigo geinimjat (佢地一定會記得依個記念日) They sure will remember this anniversary ☑ C) Frankie dui keui neuipangjau hou hou (Frankie 對佢女朋友好好) Frankie treat her girlfriend very good ☐ D) Frankie faangung hou mong (Frankie 返工好忙) Frankie work very busy ☐ E) None of the above.
14	EX04	Vincent has not been himself since he broke up with his first girlfriend. He has formed the habit of taking solitary walks through town everyday after work, and he has more or less given up on trying to invite other girls out on a date. Even so, he is still family-oriented and enjoys spending the holidays with his parents and brothers and sisters. Now it is the Christmas season, I believe: *Vincent 自從同佢第一個女朋友分左手之後一直單身。佢養成左每日放工一個人去市中心散步 0 既習慣，佢幾乎都放棄邀請女仔去約會。雖然係甘，佢仍然係以家人為中心，而且好享受假日同佢 0 既家人一齊過。宜家正係聖誕節，我相信：* ☑ A) Vincent mou-bingo zeunbei hui joek ze (Vincent 無邊個準備去約遮) Vincent no-who ready to date SP ☐ B) Vincent mou zeunbei hui joek jamho-jan (Vincent 無準備去約任何人) Vincent no ready to date anybody ☐ C) Vincent moujan zeunbei hui joek gaa (Vincent 無人準備去約架) Vincent nobody ready to date SP ☑ D) Vincent zeunbei hui jeok housiu jan zaa (Vincent 準備去約好少人咋) Vincent ready to date only a few people SP ☐ E) None of the above.

15	EX01	Mary is a very busy person. She works long hours every day and has to meet many clients during work. In her spare time, she likes being on her own but would like to make time for her closest friends or family, too. She usually refuses to work during the weekend unless there is an important meeting. Today is Saturday. Mary spends the whole day reading a novel, and then has dinner with her mum. I think: *Mary 係一個好忙 0 既人。佢每日都返工返好長時間而且要見好多客。佢空閒 0 既時間都鍾意自己一個人，但係都會預留一 d 時間俾佢 0 既屋企人同埋好朋友。除非有好重要 0 既會議，如果吾係，佢拒絕週末返工。今日係星期六， 佢成日就 0 係度睇小說，然後同媽媽一齊食晚飯。我認為：* ☑ A) Mary gaamjat mou-bingo gin-guo ze (Mary 今日無邊個見過遮) Mary today no-who meet-ASP SP ☐ B) Mary gaamjat mou gin-guo jamho-jan (Mary 今日無見過任何人) Mary today no meet-ASP anybody ☐ C) Mary gaamjat moujan gin-guo wo (Mary 今日無人見過喎) Mary today nobody meet-ASP SP ☑ D) Mary gaamjat gin-guo housiu jan zaa (Mary 今日見過好少人咋) Mary today meet-ASP only a few people SP ☐ E) None of the above.
16	NEG01	Tom ate a lot during the weekend because he had parties with all his friends. But now he has a very bad stomach and feels like throwing up whenever he sees any food. He does not want to eat anything. I think: *Tom 週末食左好多 0 野，因為佢同佢 0 既朋友有個 party。但係宜家佢個肚好吾舒服，感覺一見到 0 野食隨時都想嘔。佢完全吾想再食任何 0 野喇。我認為：* ☐ A) Tom mou-matje soeng sik ze (Tom 無乜野想食遮) Tom no-what want to eat SP ☑ B) Tom mou soeng sik jamho-je aa (Tom 無想食任何野呀) Tom no want to eat anything SP ☑ C) Tom mou-je soeng sik aa (Tom 無野想食呀) Tom nothing want to eat SP ☐ D) Tom soeng sik housiu je zaa (Tom 想食好少野咋) Tom want to eat only a few things SP ☐ E) None of the above

17	EX02	Kitty often feels sick when she's very hungry. This afternoon, she just had a tiny cup of yogurt. That was not enough to fill her up, so now she's hungry. She is now on the bus to the restaurant, but it will take another 30 minutes before she gets there. She starts to feel sick, because: *Kitty 餓得太耐就會吾舒服。依個下晝，佢淨係食左一杯好細杯 0 既乳酪。甘係完全吾夠佢飽，所以佢覺得肚餓喇。佢宜家坐緊巴士去餐廳，但係仲有 30 分鐘先到達。佢開始覺得吾舒服， 因為：* ☑ A) Kitty mou-matje sik-guo zaa (Kitty 無乜野食左咋) Kitty no-what eat-ASP SP ☐ B) Kitty mou sik-guo jamho-je aa (Kitty 無食過任何野呀) Kitty no eat-ASP anything SP ☐ C) Kitty mouje sik-guo (Kitty 無野食過) Kitty nothing eat-ASP ☑ D) Kitty sik-zo housiu je zaa (Kitty 食左好少野咋) Kitty eat-ASP only a few things SP ☐ E) None of the above.
18	NEG02	Mike is a very selfish and self-centered person. He only cares about his own business and finds it waste of time to care about others, including his closest family and friends. I believe: *Mike 係一個好自私又自我中心 0 既人。佢淨係關心佢自己 0 既事，而且覺得理人地 0 既事係浪費時間，即使係佢最親 0 既屋企人同朋友 0 既事。我相信：* ☐ A) Mike mou-bingo soeng guansam ze (Mike 無邊個想關心遮) Mike no-who want to care SP ☑ B) Mike mou soeng guansam jamho-jan gaa (Mike 無想關心任何人架) Mike no want to care anybody SP ☑ C) Mike moujan soeng guansam ge (Mike 無人想關心既) Mike nobody want to care SP ☐ D) Mike soeng guansam housiu jan zaa (Mike 想關心好少人咋) Mike want to care only a few people SP ☐ E) None of the above

Appendix 12: Main study – Participants Details summary

Table 12. Data on participants of the main study

Note: NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; Missing data is coded as '/'.

	ID	Age	Gender	L2 Language(s)	Proficiency score (out of 20) [Years Of Learning Cantonese] (y;m)	Years Of Living in HK (y;m)
Native Cantonese	NS01	28	F	English/Mandarin	n/a	28
	NS02	28	M	English	n/a	28
	NS03	17	F	English/Mandarin/ Spanish	n/a	17
	NS04	27	F	English/Mandarin/ Spanish/German	n/a	20
	NS05	28	M	English/Mandarin	n/a	24
	NS06	19	M	English/Mandarin	n/a	19
	NS07	24	M	English/Mandarin	n/a	14
	NS08	51	F	English/Mandarin	n/a	51
	NS09	26	M	English	n/a	26
	NS10	27	F	English/Mandarin	n/a	27
	NS11	26	F	English/Mandarin	n/a	26
	NS12	28	M	English/Mandarin	n/a	27
	NS13	30	M	English	n/a	30
	NS14	22	M	English/Mandarin	n/a	18
	NS15	26	F	English/Mandarin	n/a	26
	NS16	23	F	English	n/a	19
	NS17	24	M	English/Mandarin	n/a	14
	NS18	32	F	English/Mandarin	n/a	32
	NS19	28	M	English	n/a	28
	NS20	28	M	English/Mandarin	n/a	28
	NS21	25	F	English/Mandarin	n/a	18
	NS22	21	F	English/Mandarin	n/a	21
	NS23	22	M	English/Mandarin	n/a	18
	NS24	40	F	English/Mandarin	n/a	40
	NS25	25	M	English	n/a	25
	NS26	28	M	Mandarin	n/a	28
	NS27	27	M	English/Mandarin	n/a	18
	NS28	27	F	English/Mandarin	n/a	26
	NS29	27	F	English	n/a	25
	NS30	24	M	/	n/a	24
	NS31	27	F	English/Mandarin	n/a	27
	NS32	26	F	English/Mandarin/ Spanish	n/a	18

	NS33	24	F	English/French	n/a	18
	NS34	26	F	English/Mandarin	n/a	26
	NS35	31	M	English/Mandarin/ Japanese	n/a	28
	NS37	27	M	English/Mandarin	n/a	23
	NS39	30	M	English/Mandarin	n/a	20
	NS40	24	F	English/Mandarin/Thai	n/a	24
	NS41	25	M	English/Mandarin/Thai	n/a	25
	NS46	24	M	English/Mandarin	n/a	24
	NS49	23	M	English/Mandarin	n/a	23
	NS51	27	M	English/Mandarin	n/a	21
	NS52	29	M	English/Mandarin	n/a	29
	NS53	31	M	English/mandarin	n/a	25
	NS54	28	F	English/Mandarin	n/a	25
	NS56	26	F	English/Mandarin/ Korean	n/a	26
L1 English/L2 Cantonese (Proficiency score <18)	Int01	26	M	Cantonese	2;6 [17]	2;6
	Int02	29	M	Cantonese	6 [16]	/
	Int03	25	F	French/Italian	2 [17]	3;6
	Int04	26	F	French	2 [18]	2;6
	Int05	27	M	Cantonese/Mandarin	0;2 [16]	3
	Int06	29	F	Mandarin	1 [17]	2
	Int07	29	F	Mandarin	1;6 [17]	2
	Int08	26	F	/	1 [17]	2
	Int09	38	F	Cantonese/Mandarin	1 [17]	2;6
	Int10	36	M	French	0;8 [17]	4
	Int11	40	M	Cantonese/Italian	2 [17]	4
	Int12	41	F	Cantonese/Mandarin/ Spanish	2;6 [18]	3
	Int13	44	F	German	1;6 [18]	4
	Int14	45	F	/	1;6 [17]	5
	Int15	29	M	Cantonese/Italian	1 [17]	5
	Int16	30	M	Cantonese/Mandarin	1 [17]	4
	Int17	31	M	Mandarin	1 [17]	2
	Int18	32	F	Mandarin	1 [17]	2
	Int19	33	M	Cantonese/Manndarin	1 [17]	2
	Int20	36	F	Cantonese/Italian	0;6 [16]	2
	Int21	30	M	Cantonese/Japanese	0;4 [16]	1
	Int22	41	M	/	0;3 [16]	1
	Int23	42	M	Mandarin/German	1;6 [17]	3
	Int24	48	F	Mandarin/Spanish	1;6 [17]	3
	Int25	38	M	Cantonese	2;6 [17]	4
	Int27	29	F	Cantonese/Mandarin	5 [18]	8
	Int28	32	M	German	4;6 [18]	6
	Int29	41	M	Cantonese/German	3;6 [18]	4

	Int30	42	M	Mandarin/German	2 [17]	2;6
L1 English/ L2 Cantonese (Proficiency score ≥19)	Adv01	50	M	Cantonese	10 [20]	29
	Adv02	32	M	Cantonese/Korean	/ [20]	3
	Adv03	30	M	Mandarin/German/ French/Cantonese	29 [20]	1
	Adv04	27	F	Cantonese/Vietnamese/ German	20 [20]	13
	Adv05	26	M	Cantonese	/ [19]	1
	Adv06	49	M	French/German/Italian/ Mandarin/Cantonese/ Chiu Chow Dialect	25 [20]	22
	Adv07	49	M	Cantonese	22 [20]	22
	Adv08	32	M	Cantonese/Mandarin/ French	1 [20]	1
	Adv09	48	M	French/German/ Japanese/Cantonese	0;6 [20]	23
	Adv10	32	M	Cantonese/ Mandarin Chinese	8 [20]	0
	Adv11	62	M	Cantonese/ Nepali/French/Latin	25 [20]	25
	Adv12	49	M	Cantonese/Mandarin	30 [20]	24
	Adv13	27	M	Cantonese	2 [20]	15
	Adv14	34	M	Cantonese	30 [19]	0;2
	Adv15	67	M	Cantonese/French/ Tok Pisin	20 [20]	20
	Adv16	24	M	Cantonese	- [20]	1
	Adv17	28	M	Cantonese/Mandarin/ Japanese/Korean	8 [20]	1;0-1;4
	Adv18	/	/	/	/ [20]	/
	Adv19	27	F	Cantonese/Mandarin/ Korean/French	18 [20]	18
	Adv20	24	F	Cantonese	24 [20]	0;5-0;6
	Adv21	27	M	Cantonese	22 [20]	0
	Adv22	23	M	none	0;9 [19]	0;9
	Adv23	53	F	Cantonese	>5 [20]	>20
	Adv24	33	M	Cantonese	1;6 [20]	2
	Adv25	29	F	Cantonese/French/ Japanese	1 [19]	1
	Adv26	34	M	Cantonese/French/ Spanish	2 [20]	3
	Adv27	56	M	Cantonese/French/ German	20 [19]	20
	Adv29	48	F	Cantonese	4 [20]	5

Appendix 13: Main study – Results of the GJT

Appendix 13.1: Raw Data

Note. NS = native speakers of Cantonese; Int = intermediate L2 learners; Adv = advanced L2 learners; C_{NP} = controls with referential NP; C_{NegQ} =controls with ordinary NegQ; F = finite; NonF = nonfinite; B = ungrammatical word order (SVO of Neg-whQobj/NegQobj constructions, SOV of NPobj constructions); G = grammatical word order (SOV of Neg-whQobj/NegQobj constructions, SVO of NPobj constructions); Missing data is coded as '/'.

Table 13.1.A. Raw data on control items

Code	C_{NP} B01	C_{NegQ} B02	C_{NegQ} B03	C_{NP} B04	C_{NegQ} B05	C_{NP} B06	C_{NP} G01	C_{NegQ} G02	C_{NP} G03	C_{NegQ} G04	C_{NegQ} G05	C_{NP} G06
ID/No	13	30	26	35	21	07	03	20	31	27	14	08
NS01	-2	-2	-1	-2	1	-1	-2	2	2	2	-1	2
NS02	-2	-2	-2	-2	-2	-1	2	2	2	1	x	2
NS03	-2	-2	-1	-2	-2	-2	1	-1	2	2	-1	2
NS04	-2	-2	-2	-1	-2	-2	2	2	2	2	1	2
NS05	-2	-1	-2	-1	-2	-1	1	1	2	1	1	2
NS06	-2	-2	-1	-2	-1	-2	2	2	2	2	1	2
NS07	-2	-2	-1	-2	-1	-2	2	1	2	1	1	2
NS08	-2	-2	-2	-2	-2	-2	2	-1	2	2	-2	2
NS09	-1	-2	-1	-1	-2	-2	1	1	2	2	1	2
NS10	-2	-2	-2	-2	-2	-2	2	-1	2	-1	-1	2
NS11	-2	-2	-1	-2	-2	1	2	-2	2	2	-1	2
NS12	-1	-1	-2	1	-2	-1	-1	1	2	1	1	1
NS13	-2	-2	-2	-2	-2	1	2	2	2	2	1	2
NS14	-1	-1	-1	-1	-1	-2	2	2	2	2	2	2
NS15	-2	-2	-2	-2	-2	-1	1	1	2	1	-2	1
NS16	-2	-1	-1	1	-2	-2	2	1	2	2	-1	2
NS17	-2	-2	-2	1	-2	-2	2	-1	2	2	1	2
NS18	-2	-2	2	2	2	1	1	2	-2	-2	-2	2
NS19	-1	-1	-2	1	-1	-1	1	2	2	2	1	1
NS20	-2	-2	-2	1	-2	-2	2	-1	2	2	-1	1
NS21	-2	-2	-1	-2	-2	-1	2	2	2	2	2	2
NS22	-2	-2	-2	-2	-2	-1	1	1	2	2	-1	1
NS23	-2	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS24	-1	-2	-2	-1	-2	-1	1	2	2	2	1	1
NS25	-2	-2	-2	-2	-1	1	2	2	2	2	2	2
NS26	-2	-1	-1	-2	-1	-2	2	1	2	2	-1	2
NS27	-1	2	-2	2	1	2	-1	-1	2	-1	2	2
NS28	1	-1	-1	-1	-1	-2	2	1	2	1	-1	2
N29	-2	-1	-1	1	-1	-2	2	1	2	2	x	2
NS30	-2	-2	-2	-2	-2	-2	2	2	2	2	-1	2
NS31	-2	-2	-2	-2	-2	-1	2	1	2	2	1	2

NS32	1	-2	-2	-2	-1	-2	2	2	2	2	1	2
NS33	-2	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS34	-1	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS35	-1	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS36	1	x	x	-2	-2	x	2	2	2	2	1	2
NS37	-1	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS38	1	x	x	-2	-2	-2	2	2	2	2	1	2
NS39	-1	-2	-2	-2	-1	-2	2	2	2	2	1	2
NS40	1	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS41	-2	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS42	-1	x	x	x	-2	-1	2	2	2	2	1	2
NS43	-2	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS44	1	-2	-2	-2	-1	x	2	1	2	2	1	2
NS45	-1	x	x	x	-2	-2	2	1	2	2	1	2
NS46	-1	-2	-2	-2	-1	-2	2	1	2	2	1	2
NS47	1	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS48	-2	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS49	-2	-2	-2	-2	-1	-2	2	1	2	2	1	2
NS50	-2	x	x	x	-2	x	2	2	2	2	1	2
NS51	-2	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS52	-2	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS53	-2	-2	-2	-2	-2	-2	2	2	2	2	1	2
NS54	-2	-2	-2	-2	-2	-2	2	1	2	2	1	2
NS55	-1	-1	x	2	-1	x	2	2	2	2	2	2
NS56	-2	-2	-2	-1	-2	2	2	1	2	2	-1	2
Int01	-1	-1	-1	-1	-2	-2	2	-1	2	2	2	1
Int02	-1	-2	2	-1	2	-2	2	2	2	2	1	2
Int03	-1	1	x	1	-2	1	1	1	1	1	x	1
Int04	-1	x	1	x	1	-1	1	-1	1	-1	x	1
Int05	-1	-2	-1	-2	-1	-1	1	-1	1	1	2	2
Int06	x	-2	-1	-1	-1	-1	2	1	2	2	1	2
Int07	1	-1	-1	1	-2	1	1	1	2	-1	1	2
Int08	-2	-2	-2	-1	-1	-2	2	x	1	1	-1	1
Int09	-1	-1	-2	-2	-2	-2	1	2	1	1	1	2
Int10	-1	-2	-1	1	-1	-1	1	-1	2	2	2	2
Int11	-2	-2	1	-1	-1	-1	2	2	1	1	1	1
Int12	-1	-1	-1	2	-1	-1	1	-2	1	1	-1	2
Int13	-2	-1	-2	-1	-1	-1	1	-1	2	2	-1	2
Int14	-1	-1	-2	-2	-2	-2	2	2	1	2	1	1
Int15	1	-1	-1	-2	-2	1	2	1	-1	-1	2	1
Int16	-2	-1	-1	-2	-1	-1	2	2	1	2	2	2
Int17	-1	-1	-1	-1	1	-1	2	1	-2	1	2	2
Int18	-2	1	-2	-2	-1	-1	1	1	1	2	1	2
Int19	-2	-2	1	-2	-2	-1	1	-1	-1	1	1	1
Int20	-1	-1	-2	-1	-1	-1	1	1	2	2	2	1

Int21	-2	-1	-2	-1	-2	-1	2	-2	2	1	1	2
Int22	-1	-1	-2	-1	-1	-2	1	-2	1	-1	2	1
Int23	-1	-2	-1	1	-2	-2	2	1	2	2	2	1
Int24	-2	-2	-1	-2	-1	-2	1	1	1	1	2	2
Int25	-2	-2	-1	-1	-1	-1	2	2	1	1	1	2
Int26	-1	-2	-2	x	x	-1	1	1	-1	-1	1	1
Int27	-1	1	-2	-1	-1	-1	1	-1	2	-1	2	2
Int28	1	-2	-1	-1	-2	-1	2	-2	2	2	2	1
Int29	-2	-1	-1	-1	-2	-1	1	1	1	1	1	2
Int30	-1	-2	-1	-1	-2	-2	2	1	2	2	1	2
Adv01	-1	-1	-2	1	-1	-1	2	2	2	2	2	2
Adv03	-2	-2	1	-2	-2	1	1	-1	2	2	-1	2
Adv04	-1	-2	1	-1	1	-2	2	2	2	2	1	2
Adv05	1	-1	1	-1	-1	2	2	2	2	2	-1	-1
Adv06	-1	-2	-2	-2	-2	1	2	-1	2	2	1	2
Adv07	-2	-2	-2	-1	-2	-2	2	-1	2	-1	1	-2
Adv08	-2	-2	-2	-2	-2	-2	2	-2	2	-1	-1	2
Adv09	-1	2	1	-1	-2	-1	1	1	2	-2	-1	1
Adv11	-2	-2	-1	-1	-2	-2	1	-1	1	1	-1	-2
Adv12	2	-2	-2	-1	-2	2	2	1	2	2	2	2
Adv13	1	-2	-2	-2	-2	-2	2	-2	2	2	2	-1
Adv14	-2	-2	-2	-2	-1	-2	1	2	2	-1	2	-1
Adv15	1	1	-1	-1	1	-1	-2	1	2	1	-1	1
Adv17	-2	-2	1	-1	1	-1	2	-1	2	2	-2	2
Adv18	-2	x	-2	-2	1	x	-1	-2	-1	1	x	-1
Adv20	-2	-2	-2	-2	-2	-2	2	2	2	2	2	2
Adv21	-1	-1	-1	-2	-1	-1	2	-1	2	1	-1	-1
Adv22	1	1	-1	-1	1	-1	x	-1	2	-2	1	2
Adv23	-2	-2	-2	-2	-2	-2	2	2	2	2	2	2
Adv24	-2	2	1	-2	2	-1	2	-1	2	-1	-1	1
Adv25	-2	1	-1	-1	-1	-1	x	-2	2	-1	-1	1
Adv26	-1	1	1	-1	2	-1	1	-1	1	-1	-1	1
Adv27	-1	1	1	1	1	1	1	1	1	-1	-1	1
Adv28	-1	-1	1	-1	1	1	1	1	1	1	-1	1
Adv29	-2	-2	1	-2	1	-2	1	2	2	-2	-2	2

Table 13.1.B. Raw data on experimental items with finite verbs

Code	FB01	FB02	FB03	FB04	FB05	FB06	FG01	FG02	FG03	FG04	FG05	FG06
ID/No	12	32	04	22	15	02	36	24	09	28	23	16
NS01	1	2	1	1	-1	-1	2	2	1	1	1	1
NS02	-2	x	-1	-1	-2	1	-1	2	x	-1	-1	1
NS03	-2	-2	-2	-2	-2	-1	1	-1	-2	-1	-1	-1
NS04	-2	1	-2	-2	-2	2	2	2	1	1	-1	2
NS05	-1	1	-2	-2	-2	-1	1	2	-1	-1	1	-1
NS06	-1	x	-1	-2	-2	-1	2	2	1	2	1	2
NS07	1	-1	-1	-1	-2	-1	-1	2	-1	-1	1	-1
NS08	-2	-2	-2	-2	-2	-1	-2	-1	-2	-2	-1	1
NS09	-2	1	-1	-1	-2	-2	2	2	1	1	1	1
NS10	-2	-2	-2	-2	-2	-1	-1	-2	-1	-2	-2	-1
NS11	-2	x	-2	-2	-2	-2	1	1	-2	1	-2	-2
NS12	-2	-1	-2	-1	-2	-2	1	1	1	1	2	1
NS13	-1	2	-2	-2	-2	1	-1	1	1	-1	-1	2
NS14	-1	1	-1	-1	-2	-1	2	2	-1	1	1	1
NS15	-2	-2	-2	-2	-2	-1	1	-2	-2	-2	-2	-2
NS16	-2	-1	-1	-1	-2	-1	2	-1	-2	-1	-1	-1
NS17	-2	-2	-1	-2	-1	-1	-1	-1	-1	-2	-2	-1
NS18	1	2	2	-2	2	1	-2	1	2	2	-2	2
NS19	-1	-1	-2	-1	-1	-1	1	1	2	2	-1	2
NS20	-2	1	-2	-2	-2	2	2	1	1	1	1	1
NS21	-1	-1	-2	-1	-1	-1	-2	2	1	-1	2	-2
NS22	-2	2	-2	-2	-2	1	1	-2	-2	-2	-2	-1
NS23	-2	1	-1	-1	-2	1	1	1	-2	2	-1	1
NS24	-2	-1	-2	-1	-2	1	1	2	1	2	2	1
NS25	-2	1	-2	-2	-2	2	2	2	1	1	1	1
NS26	-2	2	-1	-1	-2	2	1	2	-1	1	2	1
NS27	2	-1	-1	1	2	-2	-1	2	-2	2	2	-2
NS28	-2	1	-2	-2	-2	-1	1	2	1	-1	1	1
NS29	-1	2	-1	1	-1	-1	x	2	-1	-1	-1	-1
NS30	-2	-2	-2	-2	-2	-1	2	2	2	-2	-1	-2
NS31	-2	-2	-2	-2	-2	1	1	1	-1	1	1	1
NS32	-1	-2	x	-2	-2	1	1	1	1	1	1	1
NS33	-1	-2	-2	-2	-2	2	1	1	-1	1	1	1
NS34	-2	-2	-2	-2	-2	1	-1	1	1	1	1	1
NS35	-1	-2	-2	-2	-2	2	1	1	-1	1	1	2
NS36	-2	-2	x	-2	x	1	1	1	-1	1	2	1
NS37	-1	-2	x	-2	-2	1	2	1	-1	2	1	1
NS38	-1	-2	x	-2	-2	1	1	2	1	1	1	1
NS39	-2	-2	x	-2	-2	1	1	1	2	1	1	1
NS40	-2	-2	-2	-2	-2	2	-1	2	-1	1	2	2
NS41	-2	-2	-2	-2	-2	2	2	1	1	1	1	1

NS42	-1	-2	-2	-2	-2	1	1	1	-1	1	1	1
NS43	-1	-2	x	x	x	2	1	2	-1	2	2	2
NS44	-1	-2	x	x	-2	2	1	2	2	2	1	1
NS45	-2	-2	-2	-2	-2	1	1	1	1	1	1	2
NS46	-1	-2	-2	x	x	1	2	2	1	1	2	1
NS47	-1	-2	x	x	-2	1	1	1	-1	1	1	1
NS48	-2	-2	-2	-2	x	2	-1	1	-1	2	1	1
NS49	-1	-2	-2	-2	-2	2	1	2	-1	1	2	1
NS50	-1	-2	x	-2	-2	2	1	1	1	1	1	2
NS51	-1	-2	-2	-2	-2	1	2	1	1	1	1	1
NS52	-2	-2	-2	-2	-2	1	1	2	-1	1	1	1
NS53	-2	-2	x	-2	-2	1	1	1	1	1	1	1
NS54	-1	-2	-2	-2	-2	1	-1	2	1	1	2	1
NS55	1	1	-1	1	-2	1	2	2	x	1	2	1
NS56	-2	-2	-2	-2	-2	-1	1	1	-1	-2	2	2
Int01	-1	2	-1	-1	-1	-1	-1	1	2	-1	1	2
Int02	x	2	-2	-2	2	-2	1	-1	-1	-2	-1	-2
Int03	-1	1	-1	1	1	1	-1	-1	-2	1	-1	-1
Int04	1	1	1	-1	x	-1	-1	-1	1	-1	x	x
Int05	-1	-1	-2	-1	-1	1	-1	2	1	1	2	1
Int06	1	-1	-2	-1	x	-1	2	2	x	1	2	1
Int07	-1	1	-1	1	1	2	1	-1	1	-1	-1	-1
Int08	-2	-2	-1	-2	-1	1	-1	2	x	-1	-1	1
Int09	-2	1	1	1	-2	1	1	-1	-1	-1	1	1
Int10	-1	1	1	2	1	x	-1	-2	-2	-2	2	-1
Int11	-2	1	-2	1	-2	1	1	1	2	1	1	2
Int12	-1	-2	/	x	x	1	-1	-1	-1	2	1	-2
Int13	-1	2	-1	-1	-1	2	-2	1	-1	1	-2	2
Int14	-2	1	1	-2	-2	2	2	2	1	-1	-1	1
Int15	-2	1	-2	2	1	-1	1	1	-2	-1	-1	-1
Int16	-2	-1	1	-1	-1	1	2	1	-1	1	-2	1
Int17	-1	-2	-1	/	-1	-2	2	2	1	1	-2	-1
Int18	-1	-1	-1	-2	-1	1	1	1	-1	-1	1	-2
Int19	-1	x	-2	-1	-2	2	1	1	-2	-2	1	-1
Int20	-2	-2	-1	/	-2	/	-1	-1	-1	1	-1	1
Int21	-1	-1	-2	1	1	1	-2	1	2	2	-1	-1
Int22	-1	-1	-1	-2	1	1	1	-1	1	/	-1	-1
Int23	-2	1	1	-1	-1	-2	1	-2	1	1	-2	-1
Int24	-2	1	-1	-2	-2	-1	-1	-1	-1	-2	1	-2
Int25	-2	2	-1	-1	-2	2	1	-1	1	1	2	-1
Int26	-1	-1	x	-2	-2	1	2	1	-1	-1	1	1
Int27	-1	-1	1	1	-1	1	-2	-1	-2	-1	2	-1
Int28	1	-2	-2	-1	-1	2	-1	-2	-1	1	1	-1
Int29	-1	-1	-1	-1	-2	-1	1	-1	-1	1	1	-2
Int30	-2	-1	-1	-2	1	-2	-1	1	2	1	1	1

Adv01	-2	-1	-2	-2	-1	-1	1	2	1	-2	-1	2
Adv03	-1	1	-2	-2	-2	-2	1	x	-1	1	x	-2
Adv04	-1	-1	-1	2	-1	1	2	2	1	-2	1	-1
Adv05	x	-1	-1	-1	1	1	x	2	1	-1	-2	x
Adv06	-2	-1	-1	-1	-2	-1	2	1	-1	1	1	1
Adv07	-2	-1	-2	-2	-2	2	-1	1	1	-1	-1	-1
Adv08	-2	-2	-2	-2	-2	1	1	-1	-2	-1	-1	1
Adv09	1	1	-2	1	-2	-1	-2	2	-2	-2	1	2
Adv11	-2	2	-1	-1	-2	x	1	-2	2	-1	-2	-1
Adv12	-2	-2	-2	-2	-2	-2	2	2	-2	2	2	-2
Adv13	-1	2	-2	-2	-2	2	2	2	1	2	1	-2
Adv14	-1	-1	-2	x	-2	-1	2	2	1	x	-1	2
Adv15	-1	1	-2	-1	-1	-1	1	-1	1	1	-1	1
Adv17	-1	-1	-2	-2	-1	-2	-1	1	-2	1	-1	-2
Adv18	-1	2	-1	x	x	x	-2	1	-1	x	x	x
Adv20	-2	-2	-2	-2	-2	2	-1	2	2	-1	2	2
Adv21	-2	-1	-2	1	-2	-1	-1	-1	-2	-1	-2	-1
Adv22	-1	-1	-1	-1	-2	1	1	x	x	1	x	-2
Adv23	-2	-2	-2	-2	-2	-2	2	2	1	2	2	2
Adv24	1	2	1	-1	1	1	1	-1	-1	2	2	-1
Adv25	2	2	1	1	1	1	-1	-1	-1	-1	-2	-1
Adv26	1	1	-1	1	1	-1	-1	-1	-1	-1	-1	-1
Adv27	1	1	-1	1	1	1	-1	-1	-1	-1	-1	-1
Adv28	-1	1	x	x	-1	x	-1	1	-1	1	1	x
Adv29	1	2	2	2	-1	-1	1	2	2	2	-2	-1

Table 13.1.C. Raw data on experimental items with nonfinite verbs

Code	Non FB01	Non FB02	Non FB03	Non FB04	NonF B05	NonF B06	NonF G01	NonF G02	NonF G03	NonF G04	NonF G05	NonF G06
ID/No	10	18	29	33	05	17	19	34	01	25	11	06
NS01	-1	1	1	1	1	1	2	2	1	2	1	1
NS02	-1	-1	-2	-2	-1	-1	1	1	1	2	-1	1
NS03	-2	-2	-2	-2	-2	-2	2	1	1	2	-1	-2
NS04	-1	-2	-2	-2	-2	-2	2	2	1	2	1	-2
NS05	-1	-1	-1	-1	-2	-2	2	2	1	2	1	-1
NS06	-1	-2	-1	-1	-2	-2	2	2	1	2	1	-1
NS07	1	-1	-1	-2	-2	-1	2	2	2	2	2	-1
NS08	-2	-2	-2	-2	-2	-2	2	1	-1	2	-1	-2
NS09	-1	-2	-2	-2	-2	-2	2	2	1	2	1	-2
NS10	-2	-2	-2	-2	-2	-2	1	-1	-2	2	-1	-1
NS11	-2	-2	-2	-2	-2	-2	2	2	2	2	-2	-2
NS12	1	-1	-2	-1	-1	-1	2	2	-1	1	1	-1
NS13	-1	-2	-1	-1	-2	-2	2	2	2	2	-1	-1
NS14	-1	-2	-1	-1	-2	-2	2	2	2	2	2	-2
NS15	-1	-2	-2	-2	-2	-2	1	1	-1	1	-1	-1
NS16	-2	-2	1	-2	2	-2	1	2	1	2	-2	1
NS17	-2	-1	-2	-2	-1	-2	2	2	2	2	-1	-1
NS18	1	-1	1	1	-2	1	-2	-2	-2	2	2	-2
NS19	-1	-1	-1	-1	-2	-1	2	1	1	2	1	-
NS20	-1	-2	-2	-2	-2	-2	1	2	-1	2	1	1
NS21	-1	-2	-1	-2	-2	-2	2	2	1	2	-1	-1
NS22	-1	-2	-2	-2	-2	-2	1	2	x	1	-1	-1
NS23	-1	-2	-2	-2	-1	-2	2	2	2	2	1	-1
NS24	-1	-2	-2	-1	-2	-2	2	1	1	2	2	-1
NS25	-1	-2	-2	-2	-2	-2	2	2	2	2	1	-1
NS26	-1	-1	-1	-1	-1	-1	2	2	2	2	1	1
NS27	-1	2	2	-1	-1	2	2	1	1	-2	1	-1
NS28	-1	-1	-1	-1	-2	-1	1	1	2	2	1	-1
NS29	-2	-1	-1	-1	-1	-1	2	2	2	2	1	-1
NS30	-2	-2	-2	-2	-2	-2	2	2	2	2	-2	2
NS31	-2	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS32	x	-2	-2	-2	-2	-2	2	1	2	2	2	-1
NS33	-2	-2	-2	-2	-2	-2	2	1	2	2	1	-1
NS34	-2	-2	-2	-2	-2	-2	2	1	2	2	1	-1
NS35	x	-2	-2	-2	-2	-2	2	1	1	2	2	-1
NS36	x	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS37	-2	-2	-2	-2	-2	-2	2	1	2	2	1	-1
NS38	-2	-2	-2	-2	-2	-2	2	1	2	2	1	-1
NS39	-2	-2	-2	-2	-2	-2	2	1	1	2	2	-1
NS40	x	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS41	x	-2	-2	-2	-2	-2	2	1	1	2	1	1

NS42	-2	-2	-2	-2	-2	-2	2	1	2	2	1	-1
NS43	x	-2	-2	-2	-2	-2	2	1	2	2	1	1
NS44	-2	x	-2	-2	-2	x	2	1	2	2	2	1
NS45	x	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS46	x	-2	-2	-2	-2	-2	2	1	1	2	1	1
NS47	-2	x	-2	-2	-2	x	2	1	2	2	2	1
NS48	x	x	-2	-2	-2	x	2	1	2	2	2	1
NS49	-2	-2	-2	-2	-2	-2	2	1	2	2	1	1
NS50	-2	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS51	x	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS52	x	-2	-2	-2	-2	-2	2	1	1	2	1	1
NS53	x	-2	-2	-2	-2	-2	2	1	2	2	2	1
NS54	-2	-2	-2	-2	-2	-2	2	1	2	2	2	-1
NS55	1	-1	-1	-1	-1	1	2	2	2	2	1	1
NS56	-2	-2	-2	-2	-2	-2	2	2	2	2	-1	-1
Int01	-1	-1	2	-1	1	-1	2	2	1	2	-1	-2
Int02	2	2	-2	2	-2	2	2	2	-1	2	-1	-2
Int03	1	1	-1	1	1	x	-1	-1	1	-1	-1	1
Int04	1	1	1	1	1	-1	-1	-1	1	-1	-1	-1
Int05	x	-2	1	-1	1	-1	2	1	1	2	2	-1
Int06	-1	-2	-2	-1	-2	-2	2	2	2	2	1	-1
Int07	1	1	-1	-1	1	/	-1	-1	1	/	-2	-1
Int08	1	1	-2	-2	-1	1	2	2	-1	2	1	1
Int09	-2	-1	1	-1	-2	-2	1	2	-1	1	1	1
Int10	2	1	-1	1	1	1	1	1	1	-1	-1	-1
Int11	-1	-2	-1	-2	-2	-1	2	1	1	2	2	-1
Int12	2	-1	1	1	-1	1	-2	-1	-1	-2	-2	-2
Int13	1	1	1	2	1	-1	-1	1	1	1	-1	-2
Int14	-1	-1	1	-2	-1	1	1	x	1	2	-1	-1
Int15	1	-1	-2	1	1	1	-1	1	1	1	1	-1
Int16	2	1	-1	-1	-1	-1	-2	1	1	-2	-1	-1
Int17	1	-2	-2	-1	-1	-1	-1	1	1	-1	1	-1
Int18	/	1	-1	1	-1	1	1	1	1	1	1	/
Int19	-1	1	1	-1	1	1	/	-1	-1	-2	-2	-2
Int20	-1	-2	-1	1	2	2	1	1	1	2	1	1
Int21	1	-1	-2	-1	-2	x	-1	-1	-1	-2	-2	-2
Int22	-2	-1	-1	2	1	-1	1	1	1	1	1	1
Int23	2	1	-1	2	-1	1	-1	-2	-1	-2	1	-1
Int24	1	1	1	1	-1	-1	-2	-2	-1	-2	-1	-1
Int25	-2	-2	-2	1	-1	-1	1	1	2	1	2	x
Int26	1	1	-1	-1	1	-1	1	2	-1	1	1	2
Int27	-1	-1	1	-1	-1	1	-2	1	1	-1	1	1
Int28	-1	-1	1	-1	1	1	-1	1	1	1	-1	-1
Int29	1	1	-1	1	-1	-1	-1	-1	-1	-2	-1	-1
Int30	-1	1	-1	-1	-1	-1	1	1	1	2	1	-2

Adv01	1	-2	-2	-1	-1	-2	1	2	-1	2	1	1
Adv03	-2	-2	-2	-2	-2	-2	1	x	1	2	-1	-1
Adv04	-1	1	-1	-2	-1	1	2	2	2	2	-1	-2
Adv05	-2	2	-1	x	-2	-2	2	1	-1	1	x	-2
Adv06	-1	-2	-1	-2	-2	-2	2	2	2	2	2	1
Adv07	-1	-2	-1	-1	-2	-2	-1	2	-2	2	-1	2
Adv08	-2	-2	-2	-2	-2	-2	1	-1	1	-1	-1	-2
Adv09	2	-1	-1	2	1	-2	-2	2	-1	-2	-1	-1
Adv11	-1	-1	-2	-2	-1	-2	-2	1	-1	1	-1	-2
Adv12	-2	-2	-2	-2	-2	-2	2	2	2	2	2	2
Adv13	-2	-2	-1	-2	-2	-2	2	2	1	2	1	-2
Adv14	-1	-2	-2	-2	-1	-1	2	2	2	2	2	1
Adv15	1	-1	-1	1	1	-1	-1	1	-2	1	-1	-1
Adv17	-1	-1	-2	-1	-1	1	1	2	2	2	-1	-1
Adv18	x	x	1	1	x	x	1	1	x	2	x	1
Adv20	-1	-2	-2	-2	-2	-2	2	2	2	2	1	-1
Adv21	-2	-1	-1	-1	-2	-1	2	1	1	2	-2	-1
Adv22	x	-2	-2	-1	x	-2	x	1	2	1	1	2
Adv23	x	-2	-2	-2	-2	-2	2	2	2	2	2	2
Adv24	2	2	-1	2	1	1	2	-1	-2	-1	1	1
Adv25	1	1	1	2	1	1	-1	-1	-2	-1	-1	-2
Adv26	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1
Adv27	1	1	1	1	-1	1	-1	-1	-1	-1	-1	1
Adv28	1	-1	-1	-1	1	-1	1	-1	-2	1	1	-1
Adv29	-1	-2	-2	-1	-2	-2	-1	-2	2	-2	-2	2

Appendix 13.2: Repeated measures ANOVA for control items

Table 13.2.A. Descriptive statistics (each item)

	Group	Mean	Std. Deviation	N
C.NP.B01	1	.3696	.60951	46
	2	.7143	.65868	28
	3	.6667	.85635	21
	Total	.5368	.69666	95
C.NP.B02	1	.5435	.88711	46
	2	.9286	.76636	28
	3	.6190	.66904	21
	Total	.6737	.81791	95
C.NP.B03	1	.5217	.83637	46
	2	.7857	.62994	28
	3	.8095	.87287	21
	Total	.6632	.79373	95
C.NP.G01	1	2.6739	.66848	46
	2	2.5000	.50918	28
	3	2.3810	.92066	21
	Total	2.5579	.69521	95
C.NP.G02	1	2.9348	.44233	46
	2	2.2857	.76290	28
	3	2.8571	.35857	21
	Total	2.7263	.60919	95
C.NP.G03	1	2.8696	.34050	46
	2	2.6071	.49735	28
	3	2.1429	1.01419	21
	Total	2.6316	.65319	95
C.NegQ.B01	1	.2391	.56509	46
	2	.6786	.66964	28
	3	.7619	1.09109	21
	Total	.4842	.76996	95
C.NegQ.B02	1	.3261	.59831	46
	2	.7857	.73822	28
	3	.9524	.92066	21
	Total	.6000	.76353	95
C.NegQ.B03	1	.4130	.68560	46
	2	.6786	.72283	28
	3	.9524	1.07127	21
	Total	.6105	.81599	95
C.NegQ.G01	1	2.2391	.76550	46
	2	1.6429	1.02611	28
	3	1.6190	1.07127	21
	Total	1.9263	.95919	95

C.NegQ.G02	1	2.7174	.65534	46
	2	2.2857	.71270	28
	3	1.9048	1.09109	21
	Total	2.4105	.84419	95
C.NegQ.G.03	1	1.6304	.79885	46
	2	2.2500	.79931	28
	3	1.6190	1.02353	21
	Total	1.8105	.89079	95

Table 13.2.B. Descriptive Statistics (mean rating)

	Group	Mean	Std. Deviation	N
C.NP.B.Mean	1	.4783	.50991	46
	2	.8095	.47513	28
	3	.6984	.61377	21
	Total	.6246	.53977	95
C.NegQ.B.Mean	1	.3261	.46872	46
	2	.7143	.35963	28
	3	.8889	.85851	21
	Total	.5649	.59762	95
C.NP.G.Mean	1	2.8261	.33510	46
	2	2.4643	.34354	28
	3	2.4603	.54238	21
	Total	2.6386	.42849	95
C.NegQ.G.Mean	1	2.1957	.51437	46
	2	2.0595	.52941	28
	3	1.7143	.78376	21
	Total	2.0491	.61110	95

Table 13.2.C. Descriptive Statistics (mean rating on grammatical and ungrammatical sentences)

Group		C.B.Mean	C.G.Mean
1	Mean	.4022	2.5109
	N	46	46
	Std. Deviation	.43116	.34855
2	Mean	.7619	2.2619
	N	28	28
	Std. Deviation	.30574	.35262
3	Mean	.7937	2.0873
	N	21	21
	Std. Deviation	.57712	.57159
Total	Mean	.5947	2.3439
	N	95	95
	Std. Deviation	.47119	.44016

Table 13.2.D: Tests of Within-Subjects Effects (Greenhouse-Geisser)

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Word Order	228.728	1.000	228.728	479.993	.000	.839	479.993	1.000
Word Order * Group	12.042	2.000	6.021	12.635	.000	.215	25.270	.996
Error(Word Order)	43.840	92.000	.477					
Object Type	8.039	1.000	8.039	50.040	.000	.352	50.040	1.000
Object Type * Group	.407	2.000	.203	1.265	.287	.027	2.530	.269
Error(Object Type)	14.781	92.000	.161					
Word Order * Object Type	7.074	1.000	7.074	34.741	.000	.274	34.741	1.000
Word Order * Object Type * Group	1.239	2.000	.619	3.041	.053	.062	6.083	.575
Error(Word Order*Object Type)	18.733	92.000	.204					

a. Computed using alpha =

Table 13.2.E: Test of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	740.001	1	740.001	3097.706	.000	.971	3097.706	1.000
Group	.303	2	.152	.634	.533	.014	1.269	.153
Error	21.978	92	.239					

a. Computed using alpha =

Appendix 13.3: Repeated measures ANOVA for experimental items (mean rating)

Table 14.3.A. Descriptive Statistics (individual item)

	Group	Mean	Std. Deviation	N
Finite.B01	1	.5217	.72232	46
	2	.6429	.62148	28
	3	.9048	.94365	21
	Total	.6421	.75675	95
Finite.B02	1	.8913	1.12008	46
	2	1.3929	.99403	28
	3	1.5238	1.07792	21
	Total	1.1789	1.10105	95
Finite.B03	1	.3478	.64005	46
	2	.8929	.73733	28
	3	.5714	.87014	21
	Total	.5579	.75394	95
Finite.B04	1	.3696	.60951	46
	2	1.0000	.94281	28
	3	.9524	1.07127	21
	Total	.6842	.87838	95
Finite.B05	1	.2391	.67280	46
	2	.9643	.88117	28
	3	.6190	.80475	21
	Total	.5368	.82269	95
Finite.G01	1	1.9130	.91472	46
	2	1.5714	.87891	28
	3	1.8571	.91026	21
	Total	1.8000	.90624	95
Finite.G02	1	2.2391	.87394	46
	2	1.5714	.92009	28
	3	1.9048	1.09109	21
	Total	1.9684	.97252	95

Finite.G04	1	1.6522	.92418	46
	2	1.4286	.87891	28
	3	1.4762	1.07792	21
	Total	1.5474	.94270	95
Finite.G05	1	1.7391	.95300	46
	2	1.5714	.95950	28
	3	1.3333	1.06458	21
	Total	1.6000	.98283	95
Finite.G06	1	1.7826	.86700	46
	2	1.3214	.90487	28
	3	1.4286	1.07571	21
	Total	1.5684	.94140	95
NonFinite.B01	1	.5435	.62206	46
	2	1.5000	1.00000	28
	3	1.1429	.96362	21
	Total	.9579	.92156	95
NonFinite.B02	1	.3261	.63436	46
	2	1.2857	.85449	28
	3	.7619	.94365	21
	Total	.7053	.87365	95
NonFinite.B03	1	.4130	.71728	46
	2	1.1429	.84828	28
	3	.6667	.73030	21
	Total	.6842	.81558	95
NonFinite.B04	1	.3261	.55993	46
	2	1.5000	.88192	28
	3	.9524	1.11697	21
	Total	.8105	.94862	95
NonFinite.B05	1	.2609	.61227	46
	2	1.2500	.79931	28
	3	.7619	.83095	21
	Total	.6632	.83297	95
NonFinite.B06	1	.3043	.66230	46
	2	1.3214	.86297	28
	3	.7143	.90238	21
	Total	.6947	.88815	95
NonFinite.G01	1	2.7826	.55430	46
	2	1.5357	1.03574	28
	3	1.9524	1.07127	21
	Total	2.2316	1.00480	95
NonFinite.G02	1	2.3913	.64904	46
	2	1.7500	.88715	28
	3	2.0952	1.09109	21
	Total	2.1368	.87044	95
NonFinite.G03	1	2.2609	.88027	46
	2	1.7500	.58531	28
	3	1.7619	1.17918	21

	Total	2.0000	.91093	95
NonFinite.G04	1	2.8696	.49927	46
	2	1.6071	1.22744	28
	3	2.1429	1.10841	21
	Total	2.3368	1.05800	95
NonFinite.G05	1	1.9130	.86477	46
	2	1.4643	.88117	28
	3	1.4762	.92839	21
	Total	1.6842	.90228	95

Table 13.3.B. Descriptive Statistics (mean rating)

	Group	Mean	Std. Deviation	N
Finite.B.Mean	1	.4833	.55757	46
	2	1.0179	.41482	28
	3	.9190	.78078	21
	Total	.7372	.62478	95
NonFinite.B.Mean	1	.3623	.50099	46
	2	1.3750	.47259	28
	3	.8333	.78174	21
	Total	.7649	.71103	95
Finite.G.Mean	1	1.8717	.59950	46
	2	1.5018	.42568	28
	3	1.6492	.62411	21
	Total	1.7135	.57750	95
NonFinite.G.Mean	1	2.4522	.39426	46
	2	1.6464	.72902	28
	3	1.9048	.81883	21
	Total	2.0937	.70723	95

Table 13.3.C. Tests of Within-Subject Contrasts

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Word Order	86.663	1	86.663	116.187	.000	.558	116.187	1.000
Word Order * Group	33.970	2	16.985	22.772	.000	.331	45.543	1.000
Error(Word Order)	68.623	92	.746					
Finiteness	3.044	1	3.044	25.287	.000	.216	25.287	.999
Finiteness * Group	.390	2	.195	1.619	.204	.034	3.238	.334
Error(Finiteness)	11.074	92	.120					
Word Order * Finiteness	1.640	1	1.640	13.182	.000	.125	13.182	.949
Word Order * Finiteness * Group	3.636	2	1.818	14.611	.000	.241	29.221	.999
Error(Word Order*Finiteness)	11.446	92	.124					

a. Computed using alpha =

Table 13.3.D. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	610.397	1	610.397	1709.866	.000	.949	1709.866	1.000
Group	.601	2	.300	.841	.434	.018	1.682	.190
Error	32.843	92	.357					

a. Computed using alpha =

Table 13.3.F. Multivariate ANOVA on each sentence type - Between-groups post hoc multiple comparisons (Games-Howell)

Games-Howell

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Finite.B.Mean	1	2	-.5345*	.11360	.000	-.8066	-.2624
		3	-.4357	.18918	.071	-.9023	.0309
	2	3	.0988	.18755	.859	-.3649	.5625
Finite.G.Mean	1	2	.3700*	.11952	.008	.0838	.6561
		3	.2225	.16236	.366	-.1737	.6187
	2	3	-.1474	.15818	.624	-.5353	.2405
NonFinite.B.Mean	1	2	-1.0127*	.11590	.000	-1.2912	-.7341
		3	-.4710*	.18589	.044	-.9312	-.0108
	2	3	.5417*	.19255	.022	.0676	1.0158
NonFinite.G.Mean	1	2	.8057*	.14953	.000	.4406	1.1709
		3	.5474*	.18790	.020	.0786	1.0162
	2	3	-.2583	.22563	.493	-.8073	.2907

Based on observed means.
The error term is Mean Square(Error) = .378.

Appendix 13.4: Repeated measures ANOVA for experimental items (accuracy rates)

Table 13.4.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
Finite.B.Acc	1	85.2174	19.52083	46
	2	67.8571	22.00289	28
	3	70.4762	34.42037	21
	Total	76.8421	25.31769	95
Finite.G.Acc	1	71.7391	33.08604	46
	2	50.0000	24.03701	28
	3	47.6190	31.28974	21
	Total	60.0000	32.09030	95
NonFinite.B.Acc	1	91.3043	17.82602	46
	2	53.5714	24.57756	28
	3	73.8095	36.35146	21
	Total	76.3158	29.53330	95
NonFinite.G.Acc	1	89.5652	16.18731	46
	2	58.5714	37.28909	28
	3	58.0952	36.82649	21
	Total	73.4737	32.54354	95

Table 13.4.B. Tests of Within-Subjects Effects (Greenhouse-Geisser)

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Finiteness	2437.675	1	2437.675	7.132	.009	.072	7.132	.753
Finiteness * Group	3824.533	2	1912.267	5.594	.005	.108	11.189	.847
Error(Finiteness)	31446.929	92	341.814					
Word Order	10568.146	1	10568.146	15.881	.000	.147	15.881	.976
Word Order * Group	2428.532	2	1214.266	1.825	.167	.038	3.649	.372
Error(Word Order)	61221.877	92	665.455					
Finiteness * Word Order	4145.127	1	4145.127	12.908	.001	.123	12.908	.945
Finiteness * Word Order * Group	854.783	2	427.391	1.331	.269	.028	2.662	.281
Error(Finiteness*Word Order)	29542.995	92	321.120					

a. Computed using alpha =

Table 13.4.C. Test of Between-Subject Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	1591376.762	1	1591376.762	978.392	.000	.914	978.392	1.000
Group	59634.874	2	29817.437	18.332	.000	.285	36.664	1.000
Error	149640.097	92	1626.523					

a. Computed using alpha =

Table 13.4.D. Between-groups post hoc multiple comparisons (Games-Howell)

MEASURE_1
Games-Howell

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
1	2	26.9565*	4.29918	.000	16.5252	37.3879
	3	21.9565*	6.82716	.010	4.9154	38.9976
2	3	-5.0000	7.51373	.785	-23.4396	13.4396

Based on observed means.
The error term is Mean Square(Error) = 406.631.

Table 13.4.E. Multivariate ANOVA on each sentence type - Between-groups post hoc multiple comparisons (Games-Howell)

Games-Howell

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Finite.B.Acc	1	2	17.3602*	5.05710	.003	5.1590	29.5615
		3	14.7412	8.04371	.179	-5.2440	34.7264
	2	3	-2.6190	8.58531	.950	-23.7190	18.4809
Finite.G.Acc	1	2	21.7391*	6.66577	.005	5.7757	37.7026
		3	24.1201*	8.39159	.017	3.7127	44.5275
	2	3	2.3810	8.20099	.955	-17.6565	22.4184
NonFinite.B.Acc	1	2	37.7329*	5.33680	.000	24.7920	50.6739
		3	17.4948	8.35662	.112	-3.3464	38.3361
	2	3	-20.2381	9.19231	.086	-42.7886	2.3124
NonFinite.G.Acc	1	2	30.9938*	7.44017	.001	12.7445	49.2431
		3	31.4700*	8.38312	.003	10.5120	52.4279
	2	3	.4762	10.68833	.999	-25.4580	26.4104

Based on observed means.
The error term is Mean Square(Error) = 831.065.

Appendix 14: Main study – Results of the CJT

Appendix 14.1: Raw Data of the CJT

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; D = distractor items; Ex = experimental items with existential contexts; NEG = experimental items with negative contexts; Missing data is coded as '/'; * item excluded for the main analysis.

Table 14.1.A. Raw data on Distractors

Code	D01	D02	D03	D04	D05	D06
No	2	5	6	8	11	13
ID/correct option selection	A/B	A/C	E	B/C	B/D	A/B/C
NS01	E	A	E	C	E	A
NS02	B	A	E	B/C	B	A/B/C
NS04	A/B	A/C	E	B/C	B	A/B/C
NS07	B	A	E	C	B	A
NS09	A/B	A	E	B/C	E	A/B/C
NS10	B	A	E	C	E	B
NS11	A	A	E	B/C	B/D	A/B
NS13	E	A	E	B/C	B/D	A/C
NS14	A	A/C	E	B/C	B/D	A/B
NS16	B	A/C	E	C	B/D	C
NS17	E	A	E	C	D	A/B
NS19	A	A	E	B/C	B	A/B
NS20	A/B	A	E	B/C	E	A/B/C
NS21	A/B	A/C	E	B/C	B/D	A
NS22	E	A/C	E	B/C	B	A/B/C
NS23	A/B	A/C	E	B/C	B/D	A/B/C
NS24	A/B	A	E	B/C	B/D	A/B/C
NS25	A/B	A/C	E	B/C	B/D	A/B/C
NS28	A/B	A	E	B/C	D	A/B
NS30	A/B	A	E	C	B/D	A
NS55	E	A/C	E	B/C	B/D	A
Int01	A	C	E	C	B/D	E
Int04	E	C	E	E	C/D	A
Int02	A	C	E	B	B	A
Int03	B	C	E	B/C	B	B/C
Int05	A	A/C	E	B/C	B/D	A/B/C
Int06	A	C	E	B	D	A/B
Int08	B	A/C	E	C	E	C
Int09	A	A	E	B	B/D	B/C
Int11	A	A/C	E	B/C	B	A/B/C
Int14	A	A/C	E	B/C	D	B

Int16	A/B	A	E	B	D	A
Int20	B	A/C	E	B	E	A/B
Int21	B	A	E	B/C	B/D	A/B/C
Int23	A/B	A/C	E	C	E	A
Int24	A	C	E	C	B/D	A/B
Int28	A/B	A/C	E	C	B	A/B/C
Int29	A/B	A/C	E	B/C	B	A/B
Int30	A	A	E	B/C	B/D	A/B/C
Adv01	A	A/C	E	B/C	B	A/B/C
Adv03	A	A	E	A/B	E	A
Adv04	A/B	A/C	E	C	B/D	A/B
Adv05	A/B	A/C	E	B/C	B/D	A/C
Adv06	A	A	E	B/C	B/E	A
Adv07	A	A/C	E	B/C	B/D	A/B/C
Adv08	A/B	A/C	E	B/C	B	A/B/C
Adv11	A	A	E	B	B/D	A/B
*Adv12	A/D	A	E	D	A/C	E
Adv13	A/B	A/C	E	B/C	B/D	A/B/C
Adv14	A	A/C	E	B/C	B/C/D	A/B/C
Adv15	A	A/C	E	B/C	D	A/B/C
Adv17	A/B	A/C	E	B/C	B/D	A/B/C
Adv18	A	A/C	E	C	D	A/B/C
Adv20	A/B	A/C	E	B/C	B/D	A/B/C
Adv21	A/B	A/C	E	B/C	B/C	A/B/C
Adv22	A/B	A/C	E	B	B/D	E
Adv23	A/B	C	E	B/C	B/D	A/B/C
Adv24	A	C	C	B	B/D	A/B
Adv25	A/B	A/C	E	B/C	B/D	A/B/C
Adv26	A/B/	A/C	E	B/C	B/D	A/B/C

Table 14.1.B. Raw data on experimental items

Code	Ex 01	Ex 02	Ex 03	*Ex 04	Ex 05	Ex 06	NEG 01	NEG 02	NEG 03	NEG 04	*NE G05	*NE G06
ID/No	15	17	1	14	10	4	16	18	12	3	9	7
Correct option selections	A/D						B/C					
NS01	A/D	A/D	D	E	D	D	B/C	A/D	A	A/B/C	A/D	A/D
NS02	A/D	A/D	A/D	E	D	A/D	C	B	B	B	A/B	A
NS04	D	B/D	D	B	D	D	C	B	B	E	B	B/D
NS07	A	D	E	D	E	D	C	A	C	B	E	D
NS09	A/D	A/D	A	B	D	E	C	B/C	B/C	B	B	B
NS10	E	A	E	E	D	D	E	B	B	B	E	D
NS11	D	D	E	B	D	D	C	B	B	E	E	D
NS13	A/D	A/D	A/D	A/B	A/D	D	C	A	A	E	A/D	A/B/C
NS14	A/D	A/D	A/C	A/B	A/D	A/D	A/B/C/D	A/B/D	A/B/C/D	B/C/D	A/B/D	A/D
NS16	D	D	E	B	D	D	C	A	B	E	D	D
NS17	A/B/C	A/D	D	E	D	D	B/C	A/B/C	B/C	B/C	D	E
NS19	D	C	E	B	D	D	C	A	B	B	D	B/D
NS20	A/B	A/D	A	B	A/D	D	E	A	B	B	A/B/D	D
NS21	D	D	D	B	E	D	C	B	C	B	B	B
NS22	D	D	E	B	D	D	B	B	E	B	B/D	D
NS23	A/D	A	D	B/C	D	D	B/C	B	B/C	E	A	A/D
NS24	E	A/D	A	E	D	E	C	A/C	B/C	B/C	A/B/C/D	A/B/D
NS25	A/B/C	A/D	A/D	A/B/C	A/D	E	C	C	B/C	B/C	A/B/C/D	A/B/C/D
NS28	D	D	D	E	D	D	E	A	B	E	A/B	D
NS30	D	A/D	A/C	E	A/D	D	A/C	A/B	A/B/C	B/C	D	A/D
NS55	B/D	A/D	D	D	D	D	C	A	B/C	B/C	D	D
Int01	A/C	B	A/B/C	D	A/B/C	A/D	C	D	D	D	E	D
Int04	C	E	E	A	B	E	D	D	D	C	D	D
Int02	D	D	B	E	D	D	A/B/C	A/C	A/C	E	D	D
Int03	D	D	E	E	D	D	A/C	B	B	B	B	A/D
Int05	D	D	D	D	D	D	A/C	B/C	B/C	E	C	E
Int06	D	B	A/D	D	D	A/D	C	A/C	A/B/C	A/B/C	D	E
Int08	D	D	D	D	D	D	B/C	A/C	B	B	B	D
Int09	D	D	D	D	D	D	C	A/C	B	E	C	B/C
Int11	D	D	E	E	C	D	A/C	A/C	A/C	A/C	C	C
Int14	D	D	E	B	D	D	C	B	B/C	E	B/C	A/D
Int16	D	D	C	C	D	D	A/C	A/C	A/B/C	B	B	B/C

Int20	A/D	A/D	D	D	D	E	C	B/C	B/C	A/B/C	B	D
Int21	A/D	A/D	D	A	D	D	A/B	A/B	B/C	A/B	A/C	D
Int23	E	D	B	B	D	C	A/C	A/B/C	B/C	B/C	E	A/D
Int24	D	D	B	C	D	D	A/B/C/D	A/B/C	A/B/C	A/B/C	B/C	B/C/D
Int28	E	D	D	E	B/D	A/D	B/C	B/C	B/C/D	C	C	B/C/D
Int29	D	A/D	D	B/C	C/D	D	A/C	A/B	A/C	C	B	B/C/D
Int30	D	D	A/B/C	A/B/C	B/D	B/D	B	B	B	B	E	D
Adv01	D	A/D	A/C	D	D	D	A/C	A/C	B/C	B	B	D
Adv03	D	A/D	D	E	E	D	B/C	A/B	E	E	D	E
Adv04	D	D	D	E	D	D	C	B	B	C	D	D
Adv05	D	A/D	B	E	D	D	C	A/C	A/C	A/B/C	C	C/D
Adv06	A	A/D	A/D	A	A/D	A/D	C	B/C	B/C	B/C	A/D	A/D
Adv07	D	D	D	D	D	D	B/C	B/C	A/C	B/C	B	E
Adv08	D	B/D	D	B	D	D	C	B	B	E	B	B/D
Adv11	D	D	D	A/B/C	D	D	A/C	A/B/C	A/B/C	A/C	A/B/D	D
*Adv12	B/D	B/C	B/D	D	B/D	A/B/C	A/B/C	D	D	A/B/C	A/D	A/B
Adv13	D	D	A	B	D	D	B/D	B	B/C	B	B	B/C/D
Adv14	E	A/D	A/B/C/D	E	B/D	E	A/C	A	A/B/C	A/B/C/D	A/B/D	A/B/C/D
Adv15	D	D	C	D	D	D	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C/D
Adv17	D	D	C/D	B/D	D	B/D	A/C	C	C/D	C/D	B/C/D	C/D
Adv18	D	D	A	E	D	E	A/C	C	A/C	E	D	E
Adv20	D	D	E	B	D	D	C	E	B/C	E	B/D	E
Adv21	A/D	A/D	A/C/D	A/B	A/D	A/D	B/C	B	A/B/C	B/C	A/B/C	A/D
Adv22	D	D	D	A	D	D	A/B/C	A/B/C	A/C	A/B	A/C/D	C/D
Adv23	D	A/B/C/D	D	A/B/C	D	D	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C
Adv24	B/D	B/D	D	B	B/D	D	A/C	A/C	A/C	A	A/C	A/B/C
Adv25	D	D	D	D	D	D	A/B/C	A/B/C	E	E	A/B/C	A/B/C/D
Adv26	D	D	D	A/B/C	D	D	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C

Appendix 14.2: Repeated measures ANOVA on experimental items with existential contexts

Table 14.2.A. Descriptive Statistics (each item)

Note. Ex = selections of option A or D or both (possible existential readings) in items with existential contexts; Ex.wrongBorC = incorrect selections of options B or C or both (possible non-existential readings) in items with existential contexts.

	Group	Mean	Std. Deviation	N
Ex01	1	71.4286	46.29100	21
	2	77.7778	42.77926	18
	3	90.0000	30.77935	20
	Total	79.6610	40.59752	59
Ex.wrongBorC01	1	14.2857	35.85686	21
	2	11.1111	32.33808	18
	3	5.0000	22.36068	20
	Total	10.1695	30.48411	59
Ex02	1	90.4762	30.07926	21
	2	83.3333	38.34825	18
	3	85.0000	36.63475	20
	Total	86.4407	34.52948	59
Ex.wrongBorC02	1	4.7619	21.82179	21
	2	11.1111	32.33808	18
	3	15.0000	36.63475	20
	Total	10.1695	30.48411	59
Ex03	1	61.9048	49.76134	21
	2	44.4444	51.13100	18
	3	70.0000	47.01623	20
	Total	59.3220	49.54498	59
Ex.wrongBorC03	1	9.5238	30.07926	21
	2	33.3333	48.50713	18
	3	30.0000	47.01623	20
	Total	23.7288	42.90721	59
Ex04	1	9.5238	30.07926	21
	2	44.4444	51.13100	18
	3	30.0000	47.01623	20
	Total	27.1186	44.83882	59
Ex.wrongBorC04	1	57.1429	50.70926	21
	2	33.3333	48.50713	18
	3	40.0000	50.26247	20
	Total	44.0678	50.07300	59
Ex05	1	90.4762	30.07926	21
	2	66.6667	48.50713	18
	3	85.0000	36.63475	20
	Total	81.3559	39.28050	59
Ex.wrongBorC05	1	.0000	.00000	21
	2	16.6667	38.34825	18

	3	.0000	.00000	20
	Total	5.0847	22.15719	59
Ex06	1	85.7143	35.85686	21
	2	77.7778	42.77926	18
	3	85.0000	36.63475	20
	Total	83.0508	37.84060	59
Ex.wrongBorC06	1	.0000	.00000	21
	2	5.5556	23.57023	18
	3	.0000	.00000	20
	Total	1.6949	13.01889	59

Table 14.2.B. Descriptive Statistics (percentage of selection)

Note. ExA = selections of option A; ExAorD = selections of any option A or D; ExAnD = selections of option A and D.

	Group	Mean	Std. Deviation	N
ExA	1	36.1905	33.83433	21
	2	14.4444	22.54987	18
	3	18.0000	28.20974	20
	Total	23.3898	29.97759	59
ExAnD	1	25.7143	29.08117	21
	2	10.0000	15.71810	18
	3	12.0000	24.62348	20
	Total	16.2712	24.76777	59
ExAorD	1	80.0000	14.14214	21
	2	70.0000	28.49148	18
	3	82.0000	21.42306	20
	Total	77.6271	21.99835	59

Table 14.2.C. Tests of Between-Subjects Effects (percentage of selection)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	ExA	5462.351[a]	2	2731.176	3.278	.045	.105	6.556	.600
	ExAnD	2945.375[c]	2	1472.688	2.527	.089	.083	5.054	.486
	ExAorD	1547.797[d]	2	773.898	1.634	.204	.055	3.268	.331
Intercept	ExA	30754.134	1	30754.134	36.910	.000	.397	36.910	1.000
	ExAnD	14863.124	1	14863.124	25.505	.000	.313	25.505	.999
	ExAorD	351389.845	1	351389.845	742.000	.000	.930	742.000	1.000
Group	ExA	5462.351	2	2731.176	3.278	.045	.105	6.556	.600
	ExAnD	2945.375	2	1472.688	2.527	.089	.083	5.054	.486
	ExAorD	1547.797	2	773.898	1.634	.204	.055	3.268	.331
Error	ExA	46659.683	56	833.209					
	ExAnD	32634.286	56	582.755					
	ExAorD	26520.000	56	473.571					
Total	ExA	84400.000	59						
	ExAnD	51200.000	59						
	ExAorD	383600.000	59						
Corrected Total	ExA	52122.034	58						
	ExAnD	35579.661	58						
	ExAorD	28067.797	58						

a. R Squared = .105 (Adjusted R Squared = .073)
b. Computed using alpha =
c. R Squared = .083 (Adjusted R Squared = .050)
d. R Squared = .055 (Adjusted R Squared = .021)

Appendix 14.3: Repeated measures ANOVA on experimental items with negative contexts

Table 14.3.A. Descriptive Statistics (each item)

Note. NonEx = selections of any of options B or C (possible non-existential readings) in items with non-existential contexts; Ex.wrongBorC = incorrect selections of options D (possible existential readings) in items with non-existential contexts.

	Group	Mean	Std. Deviation	N
NonEx01	1	80.9524	40.23739	21
	2	88.8889	32.33808	18
	3	95.0000	22.36068	20
	Total	88.1356	32.61450	59
NonEx.wrongD01	1	4.7619	21.82179	21
	2	11.1111	32.33808	18
	3	5.0000	22.36068	20
	Total	6.7797	25.35545	59
NonEx02	1	90.4762	30.07926	21
	2	88.8889	32.33808	18
	3	95.0000	22.36068	20
	Total	91.5254	28.08936	59
NonEx.wrongD02	1	9.5238	30.07926	21
	2	11.1111	32.33808	18
	3	.0000	.00000	20
	Total	6.7797	25.35545	59
NonEx03	1	90.4762	30.07926	21
	2	83.3333	38.34825	18
	3	85.0000	36.63475	20
	Total	86.4407	34.52948	59
NonEx.wrongD03	1	4.7619	21.82179	21
	2	16.6667	38.34825	18
	3	5.0000	22.36068	20
	Total	8.4746	28.08936	59
NonEx04	1	66.6667	48.30459	21
	2	72.2222	46.08886	18
	3	70.0000	47.01623	20
	Total	69.4915	46.43957	59
NonEx.wrongD04	1	4.7619	21.82179	21
	2	5.5556	23.57023	18
	3	10.0000	30.77935	20
	Total	6.7797	25.35545	59
NonEx05	1	28.5714	46.29100	21
	2	66.6667	48.50713	18
	3	55.0000	51.04178	20
	Total	49.1525	50.42195	59
NonEx.wrongD05	1	57.1429	50.70926	21

	2	16.6667	38.34825	18
	3	45.0000	51.04178	20
	Total	40.6780	49.54498	59
NonEx06	1	19.0476	40.23739	21
	2	16.6667	38.34825	18
	3	15.0000	36.63475	20
	Total	16.9492	37.84060	59
NonEx.wrongD06	1	76.1905	43.64358	21
	2	72.2222	46.08886	18
	3	65.0000	48.93605	20
	Total	71.1864	45.67821	59

Table 14.3.B. Descriptive Statistics (percentage of selection)

Note. NonExA = selections of option A; NonExAnBorC = selections of options A and B or A and C or A and B and C; NonExAorBorC = selections of any options A or B or C.

	Group	Mean	Std. Deviation	N
NonExA	1	21.4286	24.09060	21
	2	41.6667	36.38034	18
	3	51.2500	41.73459	20
	Total	37.7119	36.36882	59
NonExAnBorC	1	7.1429	17.92843	21
	2	40.2778	34.44827	18
	3	47.5000	38.81467	20
	Total	30.9322	35.76112	59
NonExAorBorC	1	82.1429	23.90457	21
	2	83.3333	24.25356	18
	3	85.0000	20.51957	20
	Total	83.4746	22.55748	59

Table 14.3.C. Tests of Between-Subjects Effects (percentage of selection)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	NonExA	9515.209[a]	2	4757.604	3.965	.025	.124	7.929	.688
	NonExAnBorC	18946.546[c]	2	9473.273	9.606	.000	.255	19.212	.976
	NonExAorBorC	84.140[d]	2	42.070	.080	.923	.003	.160	.062
Intercept	NonExA	85359.016	1	85359.016	71.132	.000	.560	71.132	1.000
	NonExAnBorC	58821.285	1	58821.285	59.644	.000	.516	59.644	1.000
	NonExAorBorC	409586.973	1	409586.973	779.408	.000	.933	779.408	1.000
Group	NonExA	9515.209	2	4757.604	3.965	.025	.124	7.929	.688
	NonExAnBorC	18946.546	2	9473.273	9.606	.000	.255	19.212	.976
	NonExAorBorC	84.140	2	42.070	.080	.923	.003	.160	.062
Error	NonExA	67200.893	56	1200.016					
	NonExAnBorC	55227.183	56	986.200					
	NonExAorBorC	29428.571	56	525.510					
Total	NonExA	160625.000	59						
	NonExAnBorC	130625.000	59						
	NonExAorBorC	440625.000	59						
Corrected Total	NonExA	76716.102	58						
	NonExAnBorC	74173.729	58						
	NonExAorBorC	29512.712	58						

a. R Squared = .124 (Adjusted R Squared = .093)
b. Computed using alpha =
c. R Squared = .255 (Adjusted R Squared = .229)
d. R Squared = .003 (Adjusted R Squared = -.033)

Table 14.3.D. Between-groups post hoc multiple comparisons (Games-Howell) (percentage of selection)

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
NonExA	1	2	-20.2381	10.05810	.127	-45.0905	4.6143
	2	3	-29.8214*	10.71097	.024	-56.2227	-3.4202
		3	-9.5833	12.67352	.732	-40.5623	21.3956
NonExAnBorC	1	2	-33.1349*	9.01293	.003	-55.6027	-10.6671
	2	3	-40.3571*	9.52025	.001	-63.9891	-16.7252
		3	-7.2222	11.88511	.817	-36.2731	21.8287
NonExAorBorC	1	2	-1.1905	7.73890	.987	-20.1083	17.7274
	2	3	-2.8571	6.94719	.911	-19.7896	14.0753
		3	-1.6667	7.33024	.972	-19.6407	16.3074

Based on observed means.
The error term is Mean Square(Error) = 525.510.
*. The mean difference is significant at the

Appendix 14.4: Repeated measures of ANOVA on average A-selections in both contexts

Table 14.4.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
ExA	1	36.1905	33.83433	21
	2	14.4444	22.54987	18
	3	18.0000	28.20974	20
	Total	23.3898	29.97759	59
NonExA	1	21.4286	24.09060	21
	2	41.6667	36.38034	18
	3	51.2500	41.73459	20
	Total	37.7119	36.36882	59

Table 14.4.B. Tests of Within-Subjects Effects (Greenhouse-Geisser)

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Context	6820.429	1	6820.429	6.419	.014	.103	6.419	.702
Context * Group	13962.105	2	6981.053	6.570	.003	.190	13.141	.895
Error(Context)	59499.335	56	1062.488					

a. Computed using alpha =

Table 14.4.C. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	109292.721	1	109292.721	112.587	.000	.668	112.587	1.000
Group	1015.455	2	507.727	.523	.596	.018	1.046	.132
Error	54361.240	56	970.736					

a. Computed using alpha =

Appendix 15: Main study – Results of the PJT

Appendix 15.1: Raw Data of the PJT

Note. NS = native speakers of Cantonese; Int = intermediate; Adv = advanced; D = distractor; M = matching sentence and picture; MisM = mismatching sentence and picture; NonS = non-scrambled experimental items where the Neg-whQsubj precedes the ∀obj; S = scrambled experimental items where the ∀obj precedes the Neg-whQsubj; Col = pictures depicting the collective reading; Dis = pictures depicting the distributive + 'only a few' reading; Missing data is coded as '/'; * Item excluded from the main analysis.

Table 15.1.A. Raw data on distractors with matching sentence and picture

	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10
ID/No	15B	06B	02A	09B	10A	05B	12B	14A	17B	19B
NS01	1	2	1	2	2	2	2	2	2	1
NS02	-1	2	2	2	2	2	1	1	2	1
NS04	2	1	-1	2	2	1	2	2	2	2
NS05	-2	2	2	2	2	2	2	2	2	2
NS06	2	2	2	2	2	2	2	2	2	2
NS07	-1	2	2	2	2	2	-1	-1	2	-1
*NS08	/	2	/	2	2	2	/	/	1	/
NS09	-2	2	2	2	2	2	-2	-2	2	-2
*NS10	1	2	2	2	2	2	2	-1	1	2
NS11	1	2	2	2	2	2	1	1	1	1
NS12	2	2	1	2	2	2	2	2	2	2
NS13	1	2	2	2	2	2	2	-2	2	2
NS14	1	2	2	2	2	2	1	2	1	1
NS15	-2	2	1	2	2	1	-2	1	2	2
NS16	1	2	2	2	2	2	1	1	2	-1
NS17	2	2	2	1	2	2	2	2	-1	2
NS18	1	2	-2	2	2	2	-2	2	2	2
NS19	2	1	2	1	2	1	-1	1	2	2
NS20	2	2	2	2	2	2	2	2	2	2
NS21	1	2	-2	2	2	2	1	1	2	-1
*NS22	-1	2	2	2	2	2	2	2	2	2
NS23	2	2	2	2	2	2	2	2	2	2
NS24	-1	1	-1	1	1	-1	-1	-1	1	x
NS25	2	2	2	2	2	2	2	2	2	2
NS26	2	2	2	2	2	2	2	2	2	2
NS27	-1	2	2	2	2	2	-1	2	2	-2
*NS28	1	2	1	2	2	2	2	-1	x	2
NS29	2	2	2	2	2	2	2	2	2	2
NS30	2	2	2	-2	2	2	2	-2	2	2
*NS31	1	2	2	2	2	2	x	1	2	x
*NS32	1	2	2	2	2	2	x	1	2	1

*NS33	1	2	2	2	2	2	x	1	2	x
*NS34	1	2	2	2	2	2	x	1	2	1
*NS35	1	2	2	2	2	2	x	1	2	x
*NS36	1	2	2	2	2	2	x	1	2	1
*NS37	1	2	2	2	2	2	x	1	2	1
*NS38	1	2	2	2	2	2	x	1	2	x
*NS39	1	2	2	2	2	2	x	1	2	x
*NS40	1	2	2	2	2	2	x	1	2	x
*NS41	1	2	2	2	2	2	x	1	2	1
*NS42	1	2	2	2	2	2	x	1	2	x
*NS43	1	2	2	2	2	2	x	1	2	x
*NS44	1	2	2	2	2	2	x	1	2	x
*NS45	1	2	2	2	2	2	x	1	2	1
*NS46	1	2	2	2	2	2	x	1	2	x
*NS47	1	2	2	2	2	2	x	1	2	x
*NS48	1	2	2	2	2	2	x	1	2	x
*NS49	1	2	2	2	2	2	x	1	2	1
*NS50	1	2	2	2	2	2	x	1	2	x
*NS51	1	2	2	2	2	2	x	1	2	x
*NS52	1	2	2	2	2	2	x	1	2	1
*NS53	1	2	2	2	2	2	x	1	2	x
*NS54	1	2	2	2	2	2	x	1	2	1
NS55	2	2	2	2	2	2	2	2	2	2
NS56	2	2	2	2	2	2	2	-2	2	1
*Int01	-2	2	2	2	2	x	x	-2	-2	2
Int02	-2	1	2	1	2	1	-2	-2	2	-2
Int03	1	1	1	1	1	1	1	1	1	1
*Int04	-1	1	-1	1	1	1	1	-1	1	1
Int05	1	1	-1	2	1	-1	-1	1	1	1
*Int06	1	1	1	2	1	2	1	1	1	-1
Int07	1	2	-2	1	1	2	1	1	1	2
Int08	2	2	-2	2	2	-1	-1	2	2	1
Int09	-1	2	2	2	2	1	-1	2	2	-1
Int10	2	1	1	2	2	1	-1	2	2	1
Int11	-1	2	-1	2	1	-1	1	-1	2	1
Int12	1	1	1	1	1	1	1	-1	1	-1
Int13	1	1	-2	1	1	-1	2	2	1	1
*Int14	-2	1	-2	1	2	1	2	1	1	2
*Int15	2	1	-2	-1	2	1	1	1	-1	1
Int16	-1	1	1	-1	1	1	1	2	-2	2
Int17	1	2	1	1	1	1	/	-1	1	1
Int18	1	2	2	1	1	-2	1	1	1	2
*Int19	1	2	2	1	1	x	1	2	1	-2
Int20	2	1	2	2	2	1	-2	2	1	1
Int21	1	1	-1	2	1	1	-1	-1	1	2

*Int22	2	1	2	1	1	x	-1	-1	2	1
Int23	1	1	1	1	1	2	1	2	2	1
Int24	1	1	1	-2	2	2	1	1	2	-1
Int25	2	2	1	1	2	1	1	1	-1	-1
*Int26	1	1	-2	/	2	/	x	-1	2	-1
Int27	2	1	1	1	1	1	1	1	-1	1
Int28	1	1	2	1	1	-1	2	-1	2	1
Int29	-1	1	2	1	1	1	1	1	1	1
Int30	-1	2	1	1	2	1	1	1	1	1
Adv01	-1	2	2	2	2	1	-1	1	2	1
*Adv03	x	1	2	x	2	1	-2	1	-2	x
Adv04	-2	1	-2	1	2	-2	-2	-2	2	-2
*Adv05	1	-1	1	2	2	x	2	-2	2	2
Adv06	2	2	1	2	2	2	1	2	2	2
Adv07	2	2	2	2	2	2	-2	1	2	2
Adv08	1	2	2	2	2	2	2	2	2	2
*Adv09	-2	2	2	x	2	x	2	-1	2	2
*Adv11	1	2	1	2	2	1	2	2	2	2
Adv12	1	2	2	2	2	2	1	2	2	2
Adv13	2	2	2	2	2	2	2	2	2	2
Adv14	2	2	2	2	2	1	2	2	-2	2
Adv15	1	-1	1	-1	1	-1	1	1	-1	1
Adv17	1	2	-1	2	2	2	-2	-1	2	1
*Adv18	-1	1	-1	1	1	x	x	-2	1	-2
*Adv20	/	-1	/	1	1	2	/	/	2	/
Adv21	1	2	2	2	2	2	2	2	2	2
Adv22	1	2	-2	2	2	-2	-2	-2	2	2
Adv23	1	2	-2	2	2	2	1	1	2	1
Adv24	2	2	2	2	2	2	2	-2	2	2
Adv25	2	-2	-1	1	2	-1	-2	-2	2	2
*Adv26	x	1	-2	1	1	1	-1	-1	1	x
Adv27	-1	2	1	2	2	2	1	-2	2	-1
Adv28	-1	1	-1	1	1	1	-1	-1	1	1
Adv29	1	-2	-1	2	1	-2	2	1	2	2

Table 15.1.B. Raw data on distractors with mismatching sentence and picture

	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10
ID/No	15A	06A	02B	09A	10B	05A	12A	14B	17A	19A
N01	2	1	2	-1	-1	-1	1	1	-1	2
N02	2	-2	1	1	-1	-1	2	2	1	2
N04	2	-1	-1	-2	1	-1	2	2	2	2
N05	1	-2	-1	-2	-2	-1	1	-2	-2	-2
N06	-1	1	1	-1	1	-1	-1	-1	-2	-1
N07	2	-2	-1	-2	-2	-1	x	2	-2	2
*N08	2	/	-1	/	/	2	2	2	/	1
N09	2	-2	1	-2	-2	-1	2	2	-2	2
*N10	-2	-2	1	-2	-2	-2	-2	1	-2	1
N11	-1	-2	-2	-2	-2	-2	2	-1	-2	-2
N12	1	-1	-1	-2	-1	-1	1	1	-1	-1
N13	-2	-1	-2	-2	-2	-2	1	1	-2	-1
N14	1	-2	-2	-2	2	-2	1	1	-2	1
N15	1	-2	-2	-2	-2	-2	2	-1	-2	-2
N16	2	-2	1	1	1	-2	2	2	1	1
N17	1	-2	-2	-2	-2	-2	-1	-2	-2	-1
N18	2	-2	-2	2	2	-2	2	2	1	2
N19	1	-1	-1	-2	-1	-1	1	2	-1	1
N20	1	-2	-2	-2	-2	-2	-2	1	-1	1
N21	-2	-2	1	-2	-1	-2	-2	-2	-1	2
*N22	2	-1	1	-2	-2	-1	-1	x	-2	x
N23	1	-1	-2	-2	-2	-2	1	1	1	1
N24	1	-1	1	-1	-1	1	1	1	-1	1
N25	1	-2	2	-2	-2	-2	2	2	-2	2
N26	2	-2	x	-2	-2	2	2	2	/	2
N27	2	-2	-2	-2	-2	-2	-1	-1	-2	2
*N28	-1	-2	2	-1	-2	-1	-1	2	x	-1
N29	1	-2	1	-2	-2	-2	1	2	-2	1
N30	-2	-2	-2	2	/	-2	-2	2	-2	-2
*N31	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N32	-1	-2	1	-2	-2	-2	1	-2	-2	-2
*N33	-1	-2	-1	-2	-2	-2	1	-2	-2	1
*N34	-1	-2	1	-2	-2	-2	1	-2	-2	-2
*N35	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N36	-1	-2	1	-2	-2	-2	1	-2	-2	-2
*N37	-1	-2	1	-2	-2	-2	1	-2	-2	-2
*N38	-1	-2	1	-2	-2	-2	x	-2	-2	1
*N39	-1	-2	1	-2	-2	-2	x	-2	-2	1
*N40	-1	-2	-1	-2	-2	-2	x	-2	-2	1
*N41	-1	-2	1	-2	-2	-2	x	-2	-2	-2
*N42	-1	-2	1	-2	-2	-2	1	-2	-2	1

*N43	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N44	-1	-2	-1	-2	-2	-2	1	-2	-2	1
*N45	-1	-2	1	-2	-2	-2	x	-2	-2	-2
*N46	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N47	-1	-2	1	-2	-2	-2	x	-2	-2	1
*N48	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N49	-1	-2	1	-2	-2	-2	1	-2	-2	-2
*N50	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N51	-1	-2	1	-2	-2	-2	x	-2	-2	1
*N52	-1	-2	1	-2	-2	-2	1	-2	-2	-2
*N53	-1	-2	1	-2	-2	-2	1	-2	-2	1
*N54	-1	-2	1	-2	-2	-2	x	-2	-2	-2
N55	2	-2	1	-2	-2	-2	2	2	-2	2
N56	2	-2	2	-2	-2	-2	-2	-2	-2	1
*Int01	2	-2	-2	-2	-2	x	x	2	2	-1
Int02	2	-2	1	-2	1	-2	-1	2	-2	2
Int03	1	-1	1	-1	-1	1	1	1	-1	1
*Int04	1	-1	1	-1	-1	-1	-1	1	-1	-1
Int05	1	-1	-1	-2	1	/	-1	1	1	-1
*Int06	1	-1	/	-1	-2	-1	-2	1	-1	-1
Int07	2	-2	-2	-1	-2	-1	2	1	-2	2
Int08	1	-2	/	-1	-1	-1	1	-1	-2	2
Int09	-1	-1	x	-1	2	-1	1	-1	-1	-1
Int10	2	-1	x	-2	-2	-1	2	-1	-1	-1
Int11	1	-1	1	-1	-1	-2	1	-1	-2	-2
Int12	2	-2	1	-1	-1	-2	1	1	-2	1
Int13	-1	-1	1	-2	-1	-1	1	1	-1	1
*Int14	2	-1	/	-1	-1	-1	-1	/	-1	1
*Int15	1	-2	2	-1	-1	/	/	1	-1	-1
Int16	1	-1	-1	-2	-1	1	1	1	-1	1
Int17	-2	1	-1	-1	-2	1	2	-2	-2	-2
Int18	1	-1	-1	-2	-1	-1	-1	1	-1	-2
*Int19	-2	-2	/	-1	-2	-1	-2	2	-1	1
Int20	1	-1	-2	1	-1	-1	-2	-1	-2	x
Int21	-1	2	1	-1	-2	-1	-1	1	-1	/
*Int22	1	-2	2	-2	-1	/	1	2	-2	1
Int23	1	-1	2	-1	-1	-2	1	-1	-1	2
Int24	2	-1	2	-1	1	-2	1	1	2	1
Int25	1	-2	1	-2	-2	-1	1	-2	-1	1
*Int26	1	-1	1	-1	-1	1	x	1	-1	-1
Int27	2	-2	-1	-2	-2	-1	1	2	-2	2
Int28	1	-1	1	-2	-1	1	1	2	-2	2
Int29	1	-1	-1	-1	1	1	-1	1	-1	1
Int30	1	-1	1	-1	1	1	2	1	-1	2
Adv01	2	x	2	2	-1	-1	1	2	-1	2

*Adv03	2	x	x	2	-2	-2	x	2	-2	-2
Adv04	2	-2	1	-2	-2	1	1	2	-2	-1
*Adv05	2	1	x	1	1	1	1	1	-2	-1
Adv06	-1	-1	-1	-2	-1	-1	-1	-1	-1	-2
Adv07	-1	-2	-1	-2	-1	-1	2	-1	-2	-1
Adv08	2	-2	2	-2	-2	-2	2	2	-2	2
*Adv09	2	2	-1	2	-2	x	-2	1	-2	x
*Adv11	2	-2	2	1	-1	-2	1	1	-1	1
Adv12	2	-2	1	-2	-2	-2	2	1	-2	1
Adv13	1	-1	1	-1	-1	-1	-1	1	-1	1
Adv14	1	-1	2	-2	-2	2	-1	-1	2	2
Adv15	-1	1	-1	1	-1	1	-1	-1	1	-1
Adv17	2	-2	2	-1	-1	-1	1	1	1	2
*Adv18	1	-1	1	-1	-1	x	x	2	-2	2
*Adv20	-1	/	1	/	/	/	1	1	/	1
Adv21	2	1	1	-2	-1	1	1	1	1	1
Adv22	2	-1	2	-2	1	1	-1	2	-1	2
Adv23	2	1	2	1	1	1	2	2	1	2
Adv24	2	2	2	2	2	2	2	2	2	2
Adv25	2	2	1	1	-1	-1	2	2	2	2
*Adv26	1	-1	2	-1	-1	-1	1	1	x	1
Adv27	2	-1	2	1	1	-1	2	2	-1	2
Adv28	1	-1	1	-1	-1	-1	1	1	-1	-1
Adv29	2	-1	-2	-2	2	-1	1	2	1	1

Table 15.1.C. Raw data on non-scrambled Neg-whQ>$\forall$ experimental items

	NonS 01 Col	NonS 02 Col	NonS 03 Col	NonS 04 Col	NonS 05 Col	NonS 01 Dis	NonS 02 Dis	NonS 03 Dis	NonS 04 Dis	NonS 05 Dis
ID/No	01A	13B	04A	08A	20B	01B	13B	04B	08B	20B
N01	1	2	2	2	1	-1	1	-2	1	2
N02	2	2	1	2	-2	1	-1	2	-1	-1
N04	-1	2	-1	-1	2	-1	2	-1	1	2
N05	-1	1	-1	x	-2	1	-1	-1	x	-2
N06	-2	2	1	-2	2	1	-2	x	1	2
N07	-2	-1	-2	-1	x	1	1	1	1	1
*N08	1	2	/	-1	/	/	/	-2	/	-2
N09	2	-2	-2	1	-2	-2	2	2	2	2
*N10	x	2	-2	x	1	2	-2	2	x	1
N11	-2	1	-2	-1	1	1	-1	-1	1	-2
N12	-1	1	-1	1	2	2	-2	1	-1	-1
N13	x	2	1	-1	x	-1	1	-1	-2	2
N14	1	2	2	1	1	-1	2	-2	2	1
N15	-2	1	1	-1	-1	-1	-1	-2	1	-1
N16	-1	-2	-2	2	1	1	1	1	2	1

N17	-2	-1	-2	2	1	2	1	2	1	2
N18	2	2	2	2	-2	-2	-2	-2	1	-2
N19	-1	-1	-2	-2	-1	1	1	1	-1	1
N20	-1	2	2	-1	2	1	-2	-2	-2	-1
N21	-2	-2	-2	-1	1	1	2	1	1	-2
*N22	x	2	2	1	2	-2	x	1	x	-2
N23	-2	2	x	1	2	1	1	1	2	1
N24	2	-1	-1	x	-1	-2	1	1	1	1
N25	2	2	2	1	2	-2	2	-2	-2	2
N26	x	2	-2	2	1	2	2	2	2	2
N27	2	-2	-2	-1	-2	-2	2	2	1	2
*N28	-1	2	-1	x	2	2	-1	2	x	-1
N29	-1	2	1	1	2	2	1	1	1	2
N30	2	2	2	2	2	-2	-2	-2	-	-2
*N31	1	-1	-2	1	x	-2	-2	-1	x	1
*N32	x	x	-2	1	1	-2	-2	-1	x	1
*N33	x	-1	-2	1	x	-2	-2	-1	x	1
*N34	1	-1	-2	x	x	-2	-2	-1	x	2
*N35	x	x	-2	1	x	-2	x	-1	x	1
*N36	x	-1	-2	1	x	-2	-2	1	x	x
*N37	x	x	-2	x	x	-2	-2	-1	x	2
*N38	x	-1	-2	1	x	-2	-2	-1	x	1
*N39	1	x	-2	x	x	-1	x	-1	x	x
*N40	1	-1	-2	1	x	-1	-2	-1	x	1
*N41	x	-1	-2	1	x	-2	-2	1	x	x
*N42	x	x	-2	1	x	-2	x	1	x	x
*N43	x	-1	-2	x	x	-1	-2	-1	x	x
*N44	x	-1	-2	1	x	-2	-2	1	x	2
*N45	-1	x	-2	1	x	-2	-2	-1	x	2
*N46	1	x	-2	x	x	-2	x	-1	x	x
*N47	x	-1	-2	1	x	-2	-2	-1	x	x
*N48	1	-1	-2	1	x	-1	-2	-1	x	2
*N49	1	-1	-2	1	x	-2	-2	-1	x	x
*N50	-1	x	-2	1	x	-2	x	-1	x	x
*N51	1	-1	-2	1	x	-2	-2	-1	x	x
*N52	x	-1	-2	1	x	-1	-2	-1	x	x
*N53	1	x	-2	2	x	-2	x	-1	x	1
*N54	1	-1	-2	1	x	-1	-2	-1	x	2
N55	1	2	2	x	2	-1	-2	-1	2	2
N56	-1	-1	-2	2	-1	2	2	-2	2	2
*Int01	-1	1	1	1	-2	2	-2	-2	-1	2
Int02	-2	-2	-2	-2	1	2	2	-1	-1	2
Int03	1	2	1	2	-1	-1	-1	x	1	1
*Int04	-1	1	x	x	x	1	-1	x	x	x
Int05	-1	1	1	1	-2	2	-2	-2	-1	2

*Int06	2	1	x	1	1	1	-1	x	1	1
Int07	1	1	-1	1	1	1	2	-1	x	-1
Int08	-1	2	-2	1	1	1	2	-1	x	-1
Int09	-2	-2	-2	-2	1	2	2	-1	-1	2
Int10	2	-1	-1	-1	x	-1	1	1	1	1
Int11	-2	2	-2	1	x	1	1	-2	1	1
Int12	-2	1	-1	-1	x	2	-1	-1	x	2
Int13	-1	1	x	-1	1	1	2	2	x	-1
*Int14	2	-2	-1	1	-2	-1	-1	1	-2	-2
*Int15	x	-1	x	-1	-2	1	-1	-1	-1	1
Int16	-1	1	-1	1	-1	1	-2	2	-2	-2
Int17	1	1	-2	-1	1	2	1	1	1	2
Int18	1	1	2	1	x	1	1	1	-1	2
*Int19	-1	1	1	-1	x	-2	-2	-1	1	1
Int20	-1	2	1	1	x	-2	-2	-1	2	1
Int21	-2	-1	-2	2	-1	1	-2	-1	-1	2
*Int22	-2	-1	-2	2	2	1	-1	-1	1	1
Int23	2	-1	-1	1	2	1	-1	1	1	x
Int24	-1	2	1	2	1	2	2	1	1	1
Int25	2	2	x	-1	1	-1	2	x	-1	2
*Int26	x	-1	-1	1	x	2	2	-1	x	1
Int27	1	1	1	-1	-1	1	1	-1	-1	-1
Int28	1	2	2	-1	x	1	1	-1	1	1
Int29	-1	1	-2	-1	1	-2	1	-1	1	1
Int30	-1	1	-1	2	1	1	-1	1	1	2
Adv01	-2	-1	-1	1	1	1	-2	1	-1	-1
*Adv03	x	-2	x	1	x	-2	x	-2	-1	-2
Adv04	-2	-2	-2	2	-2	1	2	1	1	2
*Adv05	1	2	1	x	2	-1	-2	-1	-2	-1
Adv06	1	1	2	1	1	-2	-1	-1	-1	-1
Adv07	1	1	-1	1	1	-1	-1	-2	-1	-1
Adv08	2	2	2	-1	2	-1	2	-1	-1	2
*Adv09	1	1	1	1	-1	-2	-1	-1	-1	-2
*Adv11	-2	x	-2	x	2	1	x	-1	x	-1
Adv12	-1	1	2	2	1	2	2	-2	1	2
Adv13	-2	2	1	-1	1	2	1	2	2	-1
Adv14	-2	2	2	-1	2	-1	1	1	-2	1
Adv15	-1	1	1	1	1	1	-1	-1	-1	-1
Adv17	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
*Adv18	1	1	2	x	2	-1	-1	-2	x	-2
*Adv20	/	/	/	/	/	-2	2	-2	-2	1
Adv21	1	1	1	1	2	2	2	2	2	1
Adv22	-1	2	1	1	1	-1	-1	-1	1	1
Adv23	-1	2	x	-2	-1	-2	-2	-2	-1	-2
Adv24	2	2	2	2	2	-2	-2	-2	-2	2

Adv25	-1	1	1	x	1	-1	1	-1	x	1
*Adv26	-1	1	1	-1	x	1	-1	-1	1	1
Adv27	x	-2	1	-2	-2	-1	-1	-1	-1	-1
Adv28	-1	1	-1	1	x	1	-1	1	-1	-1
Adv29	1	2	-1	x	1	-1	1	-2	1	-1

Table 15.1.D. Raw data on scrambled ∀>Neg-whQ experimental items

	S01 Dis	S02 Dis	S03 Dis	S04 Dis	S05 Dis	S01 Col	S02 Col	S03 Col	S04 Col	S05 Col
ID/No	03B	07B	11B	16A	18A	03B	07A	11A	16B	18B
N01	-1	-2	2	-2	-2	-1	-1	1	-1	-1
N02	2	-1	2	-1	-2	2	2	1	1	-1
N04	-2	1	2	-1	1	-2	-1	-1	-1	-1
N05	-2	-1	2	1	-2	x	-2	-1	-2	-2
N06	-2	-2	2	-2	1	-2	2	-1	-2	-1
N07	-2	-2	2	-2	-2	-1	-1	-2	-1	-1
*N08	/	-2	2	/	/	-2	/	2	-1	-1
N09	-1	-1	-2	1	-2	-2	-2	2	-2	x
*N10	-2	-2	1	-2	-2	2	2	x	x	-1
N11	2	2	2	1	2	-2	-2	-2	-1	-2
N12	1	2	1	1	2	-2	1	-2	2	-1
N13	-1	-2	2	2	-1	x	1	-2	-2	-2
N14	2	-1	2	-2	-2	-2	-1	-1	-2	-2
N15	-1	-1	2	-2	-1	-2	1	-2	-2	-2
N16	-1	2	2	2	-1	-2	-2	1	1	-1
N17	-2	-2	2	-2	-1	-1	2	1	-1	-2
N18	-1	1	2	-2	-2	2	2	-2	-2	-2
N19	2	2	2	1	2	-1	-1	-1	-1	-1
N20	2	2	2	2	2	-2	-2	-2	-2	-2
N21	1	1	2	-1	-1	-2	-2	-1	1	-2
*N22	-2	-2	2	-2	-2	x	2	-1	x	-2
N23	2	-1	2	1	1	-2	2	-2	-1	-1
N24	1	1	1	1	1	2	x	-1	x	-1
N25	1	-1	2	1	1	-1	2	2	-2	1
N26	-1	-2	2	2	-1	x	2	2	-2	-1
N27	1	1	2	-2	-1	-2	-2	-2	-2	-2
*N28	-1	-1	2	-1	x	2	2	-1	2	x
N29	1	-2	2	-2	-2	-1	2	1	-2	-2
N30	2	2	2	2	2	-2	-2	-2	-2	-2
*N31	1	1	2	x	1	x	-2	-2	x	-2
*N32	1	1	2	x	-2	x	-2	-2	x	-2
*N33	1	1	2	x	1	x	-2	-2	x	-2
*N34	1	1	2	x	-2	x	x	-2	x	-2
*N35	1	1	2	x	-2	x	x	-2	x	-2

*N36	1	1	2	x	-2	x	-2	x	x	-2
*N37	1	1	2	x	-2	x	x	-2	x	-2
*N38	1	2	2	x	-2	-2	-2	-2	x	-2
*N39	-1	1	2	x	-2	x	x	-2	x	-2
*N40	1	1	2	x	1	x	x	-2	x	-2
*N41	1	2	2	x	1	x	x	-2	x	-2
*N42	1	1	2	x	1	-2	x	x	x	-2
*N43	1	1	2	x	-2	x	-2	-2	x	-2
*N44	1	2	2	x	1	x	x	-2	x	-2
*N45	1	1	2	x	-2	-2	-2	-2	x	-2
*N46	1	1	2	x	1	x	x	x	x	-2
*N47	1	1	2	x	1	x	x	-2	x	-2
*N48	1	1	2	x	1	x	-2	-2	x	-2
*N49	1	1	2	x	1	x	-2	-2	x	-2
*N50	-1	1	2	x	1	-2	-2	-2	x	-2
*N51	1	2	2	x	-2	x	-2	-2	x	-2
*N52	-1	1	2	x	1	x	-2	-2	x	-2
*N53	1	1	2	x	1	x	x	-2	x	-2
*N54	-1	1	2	x	1	x	-2	-2	x	-2
N55	x	-1	2	-1	-2	-2	2	x	-2	2
N56	-2	-2	2	-2	-2	-2	-2	-2	-2	-2
*Int01	-2	-2	-2	2	-1	1	2	2	-1	-2
Int02	-1	1	2	x	-2	-2	-2	-2	-2	-1
Int03	-1	-1	1	x	-1	1	1	1	/	-1
*Int04	-1	1	-1	/	1	1	-1	1	/	-1
Int05	1	-1	-2	/	-1	1	x	1	-1	-2
*Int06	-1	-2	-1	x	-2	x	x	1	-2	-1
Int07	1	-1	1	-1	-1	x	1	-1	-1	-2
Int08	-2	-1	2	-1	-1	1	1	2	x	-1
Int09	-2	1	1	1	-2	1	-2	1	-1	-1
Int10	-1	-1	-1	x	-2	2	-1	2	-1	1
Int11	1	1	2	-2	2	-1	x	1	1	/
Int12	-1	-1	-1	x	1	1	x	-1	1	-1
Int13	2	-1	1	/	-2	-1	-1	2	1	-2
*Int14	-1	-2	-1	1	-1	-1	1	1	-1	-1
*Int15	-1	-1	1	1	1	x	2	1	-1	1
Int16	1	-1	1	/	-2	1	1	-2	1	-1
Int17	-2	1	1	-1	-2	1	1	-1	1	-1
Int18	1	1	-2	-2	-2	2	1	2	1	-1
*Int19	2	-1	-1	-2	1	2	x	1	-1	x
Int20	1	1	2	/	1	-1	1	2	-1	x
Int21	-1	-1	2	x	-1	-1	-1	1	-1	-1
*Int22	-2	-1	1	-1	-1	2	1	2	-2	-2
Int23	1	1	1	-1	-1	1	1	1	-2	-2
Int24	-1	1	1	-1	-2	1	-2	-2	-2	-2

Int25	-1	-1	1	-1	-1	2	-1	-1	-2	-1
*Int26	-2	-1	1	1	-2	1	1	1	x	-2
Int27	-1	1	2	1	-1	1	1	-2	/	-2
Int28	-1	-1	2	-1	-1	x	2	-2	-2	-2
Int29	2	-1	2	-2	-1	2	1	1	-2	-1
Int30	-1	-2	2	-2	-1	-1	1	1	-2	-1
Adv01	2	-1	2	-1	1	-2	-1	-1	-1	1
*Adv03	-1	-2	1	-1	-2	x	1	x	-2	-2
Adv04	-1	-1	2	1	-1	2	-2	-2	-2	-2
*Adv05	-2	-2	2	-2	-1	2	2	1	x	2
Adv06	1	1	2	2	1	-2	-1	-1	-2	-1
Adv07	-1	-2	2	1	-2	2	2	-2	-1	1
Adv08	2	2	2	-2	-2	-1	-1	-1	-2	-2
*Adv09	-1	1	2	x	x	1	-1	2	x	x
*Adv11	1	-2	2	-2	-2	-2	1	-2	x	-1
Adv12	-2	-2	2	-2	-2	2	2	1	-1	-1
Adv13	-2	-1	-1	-2	-2	1	2	2	-1	1
Adv14	-2	2	1	-2	-2	-2	-1	-1	-1	-2
Adv15	1	1	-1	-1	-1	-1	-1	1	1	1
Adv17	-2	-2	-2	-1	-1	-2	-2	-2	-1	-1
*Adv18	-1	-1	-1	-1	1	1	1	1	-2	-1
*Adv20	1	/	2	2	2	/	1	/	/	/
Adv21	-1	-1	2	-2	-2	1	2	1	-1	-1
Adv22	1	-1	2	-2	-1	-1	1	1	-2	-1
Adv23	-1	-2	2	1	-2	x	-1	x	2	-1
Adv24	-2	-2	2	-2	2	2	2	2	-2	2
Adv25	-1	-1	1	-1	1	-1	-1	1	x	1
*Adv26	1	-1	1	-1	x	-1	1	x	x	x
Adv27	-1	-1	2	-1	-1	x	1	1	-2	-2
Adv28	2	-1	1	-1	-1	-1	1	-1	1	1
Adv29	-1	-1	2	1	1	-2	-2	1	2	2

Appendix 15.2: Repeated measures ANOVA (a multivariate approach) on distractors

Table 15.2.A. Item analysis of distractors

	Group	Mean	Std. Deviation	N
D01M	1	2.1111	1.05003	27
	2	1.9091	.81118	22
	3	2.0556	.87260	18
	Total	2.0299	.92064	67
D02M	1	2.8889	.32026	27
	2	2.3636	.49237	22
	3	2.4444	1.04162	18
	Total	2.5970	.67554	67
D03M	1	2.5185	.93522	27
	2	1.8636	.99021	22
	3	1.8889	1.18266	18
	Total	2.1343	1.05738	67
D04M	1	2.7778	.64051	27
	2	2.1818	.73266	22
	3	2.7222	.57451	18
	Total	2.5672	.70117	67
D05M	1	2.9630	.19245	27
	2	2.3636	.49237	22
	3	2.8333	.38348	18
	Total	2.7313	.44661	67
D06M	1	2.8148	.48334	27
	2	1.8182	.73266	22
	3	2.1111	1.18266	18
	Total	2.2985	.90478	67
D07M	1	2.1852	1.07550	27
	2	1.5909	.85407	22
	3	1.6667	1.23669	18
	Total	1.8507	1.07666	67
D08M	1	2.1852	1.11068	27
	2	2.0000	.87287	22
	3	1.6667	1.23669	18
	Total	1.9851	1.08002	67
D09M	1	2.8148	.48334	27
	2	2.1818	.79501	22
	3	2.6667	.84017	18
	Total	2.5672	.74313	67
D10M	1	2.2593	1.05948	27
	2	1.9091	.75018	22
	3	2.4444	.85559	18
	Total	2.1940	.92505	67
D01MisM	1	2.1111	.97402	27

	2	2.0455	.78542	22
	3	2.5000	.78591	18
	Total	2.1940	.87454	67
D02 MisM	1	.3704	.62929	27
	2	.8636	.71016	22
	3	1.0556	.99836	18
	Total	.7164	.81289	67
D03MisM	1	1.1111	1.08604	27
	2	1.3636	.95346	22
	3	2.1667	.92355	18
	Total	1.4776	1.07813	67
D04 MisM	1	.4815	.93522	27
	2	.6364	.58109	22
	3	.9444	1.10997	18
	Total	.6567	.89700	67
D05MisM	1	.6667	.96077	27
	2	1.0455	.84387	22
	3	1.1667	.92355	18
	Total	.9254	.92627	67
D06MisM	1	.5185	.75296	27
	2	1.0000	.75593	22
	3	1.3889	.84984	18
	Total	.9104	.84802	67
D07MisM	1	1.8889	1.12090	27
	2	1.8636	.77432	22
	3	2.1111	.83235	18
	Total	1.9403	.93551	67
D08MisM	1	2.0000	1.10940	27
	2	1.6818	.83873	22
	3	2.2778	.82644	18
	Total	1.9701	.96876	67
D09MisM	1	.6296	.88353	27
	2	.7273	.76730	22
	3	1.3889	1.03690	18
	Total	.8657	.93575	67
D10MisM	1	1.9630	1.09128	27
	2	1.7273	1.16217	22
	3	2.1667	.98518	18
	Total	1.9403	1.08545	67

Table 15.2.B. Descriptive Statistics (mean rates)

	Group	Mean	Std. Deviation	N
D.M.Mean	1	2.5519	.40985	27
	2	2.0182	.21300	22
	3	2.2500	.58234	18
	Total	2.2955	.47015	67
D.MisM. Mean	1	1.1741	.51035	27
	2	1.2955	.29192	22
	3	1.7167	.56282	18
	Total	1.3597	.51140	67

Appendix 15.3: Mean rating for individual experimental items

Table 15.3.A. Descriptive Statistics on non-scrambled items

	Group	Mean	Std. Deviation	N
NonS.Col 01	1	1.2963	1.20304	27
	2	1.3182	.99457	22
	3	1.1111	1.02262	18
	Total	1.2537	1.07792	67
NonS.Col 02	1	2.0370	1.15962	27
	2	2.0000	.92582	22
	3	2.0000	1.08465	18
	Total	2.0149	1.05159	67
NonS.Col 03	1	1.2963	1.26536	27
	2	1.0000	1.02353	22
	3	1.7222	1.07406	18
	Total	1.3134	1.15744	67
NonS.Col 04	1	1.6296	1.11452	27
	2	1.6364	.90214	22
	3	1.4444	1.09664	18
	Total	1.5821	1.03205	67
NonS.Col 05	1	1.6667	1.20894	27
	2	1.2273	.97257	22
	3	1.7222	1.07406	18
	Total	1.5373	1.10547	67
NonS.Dis 01	1	1.5185	1.05139	27
	2	1.9545	.89853	22
	3	1.3333	1.02899	18
	Total	1.6119	1.01437	67
NonS.Dis 02	1	1.7037	1.13730	27
	2	1.7727	1.10978	22
	3	1.4444	1.09664	18
	Total	1.6567	1.10854	67
NonS.Dis	1	1.3333	1.14354	27

03	2	1.2727	.88273	22
	3	1.1111	1.02262	18
	Total	1.2537	1.02015	67
NonS.Dis 04	1	1.7778	1.05003	27
	2	1.2727	.88273	22
	3	1.2222	.94281	18
	Total	1.4627	.98977	67
NonS.Dis 05	1	1.9259	1.17427	27
	2	2.0455	.99892	22
	3	1.5556	.98352	18
	Total	1.8657	1.07161	67

Table 15.3.B. Descriptive Statistics on scrambled items

	Group	Mean	Std. Deviation	N
S.Dis01	1	1.4815	1.15593	27
	2	1.3636	.84771	22
	3	1.2222	1.06027	18
	Total	1.3731	1.02744	67
S.Dis 02	1	1.3333	1.14354	27
	2	1.3636	.58109	22
	3	1.0556	.93760	18
	Total	1.2687	.93066	67
S.Dis 03	1	2.8148	.62247	27
	2	2.1364	.94089	22
	3	2.4444	.92178	18
	Total	2.4925	.85941	67
S.Dis 04	1	1.2963	1.17063	27
	2	.5000	.67259	22
	3	.9444	.93760	18
	Total	.9403	1.01325	67
S.Dis 05	1	1.1852	1.14479	27
	2	.8182	.79501	22
	3	.9444	.93760	18
	Total	1.0000	.98473	67
S.Col 01	1	.5556	.97402	27
	2	1.6818	.94548	22
	3	1.1667	1.20049	18
	Total	1.0896	1.12454	67
S.Col 02	1	1.4074	1.30853	27
	2	1.3182	.94548	22
	3	1.5556	1.09664	18
	Total	1.4179	1.13015	67
S.Col 03	1	.9630	1.05544	27
	2	1.5909	1.09801	22
	3	1.3889	.97853	18

	Total	1.2836	1.07034	67
S.Col 04	1	.5926	.84395	27
	2	.8182	.85280	22
	3	.9444	.99836	18
	Total	.7612	.88915	67
S.Col 05	1	.5926	.74726	27
	2	.6364	.58109	22
	3	1.3333	.97014	18
	Total	.8060	.82092	67

Appendix 15.4: Repeated measure ANOVA on experimental items

Table 15.4.A. Descriptive Statistics of experimental items (mean rating) on Sentence type (NonS versus S) and Pictures (Col versus Dis)

	Group	Mean	Std. Deviation	N
NonS.Col. Mean	1	1.6870	.73427	27
	2	1.5636	.55123	22
	3	1.6778	.75053	18
	Total	1.6440	.67630	67
NonS.Dis. Mean	1	1.6722	.69064	27
	2	1.7818	.38869	22
	3	1.3500	.75790	18
	Total	1.6216	.64316	67
S.Dis.Mean	1	1.6315	.72790	27
	2	1.3477	.36400	22
	3	1.3222	.52754	18
	Total	1.4552	.58647	67
S.Col.Mean	1	.8821	.61258	27
	2	1.3394	.49234	22
	3	1.3426	.61270	18
	Total	1.1560	.61077	67

Table 15.4.B. Tests of Within-Subjects Effects on Sentence types (NonS versus S) and Pictures (Col versus Dis)

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Sentence type	6.312	1	6.312	22.988	.000	.264	22.988	.997
Sentence type * Group	.629	2	.315	1.146	.324	.035	2.292	.243
Error(Sentence type)	17.574	64	.275					
Picture type	1.345	1	1.345	2.764	.101	.041	2.764	.374
Picture type * Group	2.877	2	1.438	2.956	.059	.085	5.912	.556
Error(Picture type)	31.141	64	.487					
Sentence type * Picture type	.680	1	.680	1.730	.193	.026	1.730	.254
Sentence type * Picture type * Group	3.186	2	1.593	4.050	.022	.112	8.101	.702
Error(Sentence type*Picture type)	25.171	64	.393					

a. Computed using alpha =

Table 15.4.C. Tests of Between-Subjects Effects on Sentence type (NonS versus S) and Picture type (Col versus Dis)

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	560.841	1	560.841	1498.934	.000	.959	1498.934	1.000
Group	.286	2	.143	.383	.684	.012	.765	.109
Error	23.946	64	.374					

a. Computed using alpha =

Appendix 15.5: Repeated measures ANOVA on non-scrambled items (mean rating)

Table 15.5.A. Tests of Within-Subjects Effects

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Picture type	.056	1	.056	.117	.734	.002	.117	.063
Picture type * Group	1.477	2	.738	1.539	.222	.046	3.078	.316
Error(Pictures)	30.701	64	.480					

a. Computed using alpha =

Appendix 15.6: Repeated measures ANOVA on scrambled items (mean rating)

Table 15.6.A. Tests of Within-Subjects Effects

Measure:MEASURE_1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Picture type	1.969	1	1.969	4.921	.030	.071	4.921	.589
Picture type * Group	4.586	2	2.293	5.730	.005	.152	11.460	.850
Error(Pictures)	25.610	64	.400					

a. Computed using alpha =

Table 15.6.B. Tests of Between-Subjects Effects

Measure:MEASURE_1
Transformed Variable:Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	224.077	1	224.077	848.201	.000	.930	848.201	1.000
Group	.218	2	.109	.412	.664	.013	.825	.114
Error	16.907	64	.264					

a. Computed using alpha =

Appendix 15.7: Repeated measures ANOVA on experimental items (percentage of positive scores)

Table 15.7.A. Descriptive Statistics

	Group	Mean	Std. Deviation	N
NonS.Col	1	51.8519	30.51318	27
	2	50.9091	21.13654	22
	3	60.0000	30.67860	18
	Total	53.7313	27.67976	67
NonS.Dis	1	62.9630	28.66448	27
	2	65.4545	18.70250	22
	3	40.0000	34.29972	18
	Total	57.6119	29.23725	67
S.Dis	1	54.0741	30.28826	27
	2	37.2727	20.74375	22
	3	38.8889	23.23509	18
	Total	44.4776	26.47375	67
S.Col	1	26.6667	24.17882	27
	2	50.9091	22.01928	22
	3	43.3333	28.49148	18
	Total	39.1045	26.61347	67

Table 15.7.B. Tests of Within-Subjects Effects
Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Sentence type	Greenhouse-Geisser	11973.854	1.000	11973.854	20.953	.000	.247	20.953	.995
Sentence type * Group	Greenhouse-Geisser	1471.544	2.000	735.772	1.288	.283	.039	2.575	.269
Error(sentencetype)	Greenhouse-Geisser	36573.232	64.000	571.457					
picturetype	Greenhouse-Geisser	340.086	1.000	340.086	.453	.503	.007	.453	.102
picturetype * Group	Greenhouse-Geisser	9016.888	2.000	4508.444	6.010	.004	.158	12.019	.868
Error(picturetype)	Greenhouse-Geisser	48012.963	64.000	750.203					

sentencetype * picturetype	Greenhouse-Geisser	.462	1.000	.462	.001	.981	.000	.001	.050
sentencetype * picturetype * Group	Greenhouse-Geisser	6390.494	2.000	3195.247	3.829	.027	.107	7.659	.675
Error(sentencetype* picturetype)	Greenhouse-Geisser	53403.535	64.000	834.430					

a. Computed using alpha =

Appendix 15.8: Repeated measures ANOVA on non-scrambled items (percentage of positive scores)

Table 15.8.A. Tests of Within-Subjects Effects (Greenhouse-Geisser)

Source	picturetype	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
picturetype	Linear	157.740	1	157.740	.188	.666	.003	.188	.071
picturetype * Group	Linear	5292.829	2	2646.414	3.160	.049	.090	6.319	.586
Error(picturetype)	Linear	53602.694	64	837.542					

a. Computed using alpha =

Table 15.8.B. Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	402113.887	1	402113.887	599.274	.000	.904	599.274	1.000
Group	1479.773	2	739.886	1.103	.338	.033	2.205	.236
Error	42944.108	64	671.002					

a. Computed using alpha =

Table 15.8.C. One-way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
S.Col.Mean	Between Groups	5.586	2	2.793	4.055	.022
	Within Groups	44.079	64	.689		
	Total	49.665	66			
S.Dis.Mean	Between Groups	2.138	2	1.069	1.482	.235
	Within Groups	46.168	64	.721		
	Total	48.307	66			

Table 15.8.D. Games-Howell post hoc test

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
S.Col.Mean	1	2	-.59293*	.22245	.028	-1.1313	-.0546
		3	-.58333	.27457	.099	-1.2552	.0886
	2	1	.59293*	.22245	.028	.0546	1.1313
		3	.00960	.26230	.999	-.6362	.6554
	3	1	.58333	.27457	.099	-.0886	1.2552
		2	-.00960	.26230	.999	-.6554	.6362
S.Dis.Mean	1	2	.39840	.22757	.199	-.1543	.9511
		3	.30648	.28405	.533	-.3852	.9982
	2	1	-.39840	.22757	.199	-.9511	.1543
		3	-.09192	.24152	.923	-.6897	.5059
	3	1	-.30648	.28405	.533	-.9982	.3852
		2	.09192	.24152	.923	-.5059	.6897

*. The mean difference is significant at the 0.05 level.

Appendix 15.9: Repeated measures ANOVA on scrambled items (percentage of positive scores)

Table 15.9.A. Tests of Within-Subjects Effects

Source	picturetype	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
picturetype	Linear	182.808	1	182.808	.245	.623	.004	.245	.078
picturetype * Group	Linear	10114.553	2	5057.277	6.769	.002	.175	13.539	.906
Error(picturetype)	Linear	47813.805	64	747.091					

a. Computed using alpha =

Table 15.9.B. Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	229799.462	1	229799.462	411.445	.000	.865	411.445	1.000
Group	893.688	2	446.844	.800	.454	.024	1.600	.181
Error	35745.118	64	558.517					

a. Computed using alpha =

Table 15.9.C. One-way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
S.Col.positive	Between Groups	8498.005	2	4249.002	6.620	.002
	Within Groups	41078.114	64	641.846		
	Total	49576.119	66			
S.Dis.positive	Between Groups	2510.237	2	1255.118	1.891	.159
	Within Groups	42480.808	64	663.763		
	Total	44991.045	66			

Table 15.9.D. Games-Howell post hoc test

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
S.Col.positive	1	2	-24.98316*	6.50695	.001	-40.7420	-9.2243
		3	-19.62963	8.64265	.076	-40.9592	1.6999
	2	1	24.98316*	6.50695	.001	9.2243	40.7420
		3	5.35354	8.74255	.815	-16.2131	26.9202
	3	1	19.62963	8.64265	.076	-1.6999	40.9592
		2	-5.35354	8.74255	.815	-26.9202	16.2131
S.Dis.positive	1	2	13.83838	7.20055	.144	-3.5989	31.2757
		3	10.00000	8.21646	.450	-9.9924	29.9924
	2	1	-13.83838	7.20055	.144	-31.2757	3.5989
		3	-3.83838	7.40140	.863	-22.0023	14.3255
	3	1	-10.00000	8.21646	.450	-29.9924	9.9924
		2	3.83838	7.40140	.863	-14.3255	22.0023

*. The mean difference is significant at the 0.05 level.

Appendix 15.10: Repeated measures ANOVA on 'distributive' pictures (percentage of positive scores)

Table 15.10.A. Tests of Within-Subjects Contrasts

Source	sentencetype	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
sentencetype	Linear	8174.924	1	8174.924	12.402	.001	.162	12.402	.934
sentencetype * Group	Linear	8737.831	2	4368.916	6.628	.002	.172	13.256	.900
Error(sentencetype)	Linear	42187.542	64	659.180					

a. Computed using alpha =

Table 15.10.B. Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	309434.840	1	309434.840	434.163	.000	.872	434.163	1.000
Group	5944.404	2	2972.202	4.170	.020	.115	8.340	.715
Error	45613.805	64	712.716					

a. Computed using alpha =

Table 15.10.C. Between-groups post hoc multiple comparisons (Games-Howell)

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-14.1077*	4.65736	.011	-25.3794	-2.8360
	3	.1852	6.66645	1.000	-16.2582	16.6286
2	1	14.1077*	4.65736	.011	2.8360	25.3794

	3	14.2929	6.44075	.086	-1.6925	30.2783
3	1	-.1852	6.66645	1.000	-16.6286	16.2582
	2	-14.2929	6.44075	.086	-30.2783	1.6925

Based on observed means.
The error term is Mean Square(Error) = 356.358.
*. The mean difference is significant at the

Appendix 15.11: Repeated measures ANOVA on 'collective' pictures (percentage of positive scores

Table 15.11.A. Tests of Within-Subjects Contrasts

Source	sentencetype	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
sentencetype	Linear	6061.530	1	6061.530	10.839	.002	.145	10.839	.900
sentencetype * Group	Linear	4041.927	2	2020.963	3.614	.033	.101	7.228	.648
Error(sentencetype)	Linear	35790.909	64	559.233					

a. Computed using alpha =

Table 15.11.B. Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	295619.713	1	295619.713	343.302	.000	.843	343.302	1.000
Group	5044.449	2	2522.225	2.929	.061	.084	5.858	.552
Error	55110.774	64	861.106					

a. Computed using alpha =

Abbreviations

ACC – accusative case

Acc – accuracy rate

ACD – antecedent-contained deletion

Adv – advanced learners

AJT – acceptability judgement task

ATB – Across-the-Board Constraint

ASP – aspectual marker

B – ungrammatical sentences

Beg – beginners

CI – conceptual-intentional

CJT – context-based judgement task

CL – classifier

D – distractors

EPW – existential polarity *wh*-words

EX – existential

EXP – Expression

FA – Full Access

FI – Full Interpretation

Fin – finite verbs

FT/FA – Full Transfer/Full Access

G – grammatical sentences

GE – possessions in Cantonese (similar to English ’s)

GJT – grammaticality judgement task

Int – intermediate learners

L1 – first language

L2 – second language

LA – Lexical Array

LCC – Linear Crossing Constraint

LEX – Lexicon

LF – Logical Forms

LR – Last Report

MC – Mandarin Chinese

MP – Minimalist Programme

NEG –negator/ negative

NegQ – negative quantifiers

Neg-whQ – negative *wh*-quantifiers

NOM – nominative case

NonFin – non-finite verbs

NP – noun phrases

NPI – negative polarity item

NS – native speakers of Cantonese

NWHC – negative *WH* construction

NWHs – negative *wh*-words

Num – numeric phrase

O/ Obj – object

O>S – object-wide scope

PF – Phonetic Forms

PJT – picture judgement task

POS – poverty-of-the-stimulus

Q – question marker

QP – (proposed) Quant-phrase / quantifier-phrase

QR – quantifier raising

RoR – rate of reliability

SD – standard deviation

SP – sentence final particle

S/ Subj – subject

S>O – subject-wide scope

V – verb

WCO – weak crossover

WH – *wh*-words/phrases

UG – universal grammar

$\forall$ – universal quantifiers

$\exists$ – existential quantifier

➚ – indicating rising tone

➘ – indicating falling tone

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