Chapter 8
Quantifiers: Form and Meaning in Second Language Development

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8.1 Introduction

The concepts of form, in the sense of linguistic structure, and meaning are central to both language teaching research and generative linguistic enquiry. In language teaching research, the issue concerns whether to highlight form or meaning in the classroom. This debate has a long history (Musumeci 1997) and in recent research has found expression in the focus on form debate as best articulated by Long (1991; see also Doughty 2001). Briefly, *focus on form*[1] involves explicit teaching of linguistic structures and contrasts with *focus on meaning*, in which language students are exposed to target forms in the classroom without any discussion of the linguistic structures themselves. In generative linguistics since the inception of the field (Chomsky 1965), form has been assumed to be at the centre of the generative

[1]For the purposes of this chapter, we will gloss over the form versus forms distinction (see Doughty and Williams 1998), considering both to fall under the focus on form umbrella.

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grammar, with meaning being read off the syntactic structure (see Adger and Ramchand 2005 for a recent illustration). Nonetheless, form-meaning mismatches, where the syntactic form does not map to one unambiguous meaning, are plentiful, and one goal of generative linguistic research is to account for such mismatches. The present chapter brings together the pedagogical interest in form versus meaning and findings from generative linguistic research that identify instances of complex form-meaning relationships. We consider form and meaning by looking at quantifiers (such as *some*, *every* and *any*) in second language (L2) acquisition. The meaning that quantifiers bring to a sentence does not always have a one-to-one correspondence with the syntax; and the syntax of quantifiers can also be surprisingly complex (as detailed throughout the chapter). We review existing L2 data, and a pilot study conducted in the classroom, to see whether learners' acquisition of the meaning and form of quantifiers can benefit from the explicit teaching of form, in contrast to exposure to target forms without explicit teaching (i.e. focus on meaning).

While not usually a 'heavyweight' topic in the language classroom like tense or articles, quantifiers have received much attention in theoretical linguistic research due to the considerable variation in the properties of quantifiers crosslinguistically (some of which, we will illustrate in this chapter). For this reason they offer second language acquisition (SLA) research an opportunity to explore core questions of native language (L1) transfer. They also embody a 'poverty of the stimulus' situation for some L2 speakers (depending on the L1) because neither naturalistic exposure to the target language nor classroom instruction provides direct evidence for all of the properties of quantifiers. Research into L2 poverty of the stimulus phenomena asks whether L2 learners have access to the same innate language acquisition mechanism that is hypothesised in L1 acquisition, namely, Universal Grammar (UG) (White 2003). The logic is that if L2 learners can acquire the L2 phenomenon despite poverty of the stimulus (i.e. the absence of direct evidence), then this would constitute evidence that their L2 development is constrained by UG in the same way as L1 development. If this is the case for quantifiers, then we might conclude that there is no need to focus on form in the classroom, but instead support a focus on meaning approach.

The existing L2 acquisition research on quantifiers falls into two main categories: studies that investigate knowledge of the interpretation, or meaning, of quantifiers and studies that investigate knowledge of distribution, that is, form. In Sections 8.2 and 8.3, we outline L2 research on quantifiers in terms of interpretation and distribution, respectively. The overall conclusion is that both meaning and form can be acquired, but in the case of quantifiers, not readily. This leads to the question of whether explicit teaching can lead to L2 development for learners not yet advanced enough to acquire quantifiers via input alone. Section 8.4 reports on a pilot study, using it as a basis to discuss the implications of generative SLA research for language teaching. We conclude with a call for more collaborative research between SLA and language pedagogy.

8.2 Quantifiers: Acquisition of Meaning

This section outlines the findings of studies by Dekydtspotter et al. (2001), Marsden (2008) and Marsden (2009), which investigate L2 knowledge of subtle meaning changes that occur when one quantifier interacts with another. The three studies share a common research question, namely, when the target language allows Interpretation A for a given sentence type, but the speakers' first language (L1) additionally allows Interpretation B, can learners acquire *the absence* of Interpretation B in the target language? In all three studies, acquisition of the more restrictive interpretation possibilities in the target language is demonstrated to be a poverty of the stimulus problem because the 'stimulus' (i.e. the sources available to the learner) does not provide direct evidence for the absence of Interpretation B. This is because the sentence types investigated in the three studies are rarely touched upon in classroom instruction, and even when these forms do occur, whether in the classroom or naturalistically, they (obviously) occur only in contexts that require Interpretation A. Such occurrences cannot serve as evidence that Interpretation B should be ruled out, given that the L1 would allow both A and B.

8.2.1 Dekydtspotter et al. (2001)

The focus of the study by Dekydtspotter et al. (2001) is an interpretation difference between two word order variants of French *combien* 'how many' questions. The word order variants are shown in (1)–(2). (1) illustrates the 'continuous *combien*' question form, in which *combien* is followed immediately by its nominal restriction *de livres* 'of books'. (2) illustrates the 'discontinuous *combien*' form, in which *de livres* occurs in object position, with *combien* alone at the beginning of the question, without the object phrase.

1. **Combien de livres** est-ce que les étudiants achètent tous?
   how many of books do the students buy all
   'How many books are the students all buying?'
2. **Combien** est-ce que les étudiants achètent tous **de livres**?
   how many do the students buy all of books
   'How many books are the students all buying?'

Although the two question forms in French share a single English form, only the continuous *combien* form (1) allows two distinct answers (as the English form does). To illustrate, consider a scenario in which Student A is buying Books X, Y and Z; Student B is buying Books X, Y and W; and Student C is buying Books X, Y and V. The answer to the question in (1) can be either 'three' (i.e. each student buys three books) or 'two' (i.e. there are two books, X and Y, that are common to all

of the students).[2] The discontinuous *combien* question (2) allows only the first interpretation or 'narrow scope' of the object (see footnote 2). The interpretive difference between continuous and discontinuous *combien* questions is argued to arise through the interaction of idiosyncratic syntactic properties of the two forms of the *combien*-de-N unit with universal properties of semantic interpretation (see the original article for full details).

The aim of Dekydtspotter et al.'s study thus is to find out whether English speakers of French know that discontinuous *combien* questions allow only one answer: the narrow-scope interpretation of the object NP. They used a truth value judgement task, with four test types:[3]

3. a. Continuous *combien* question + S>O answer
   b. Continuous *combien* question + O>S answer
   c. Discontinuous *combien* question + S>O answer
   d. *(Discontinuous *combien* question + O>S answer)

Contexts were devised that favoured either a narrow-scope (S>O) interpretation of the object or a wide-scope (O>S) interpretation. These contexts were presented to the participants as stories. At the end of each story, a *combien* question was posed, and an answer provided. The participants had to judge whether or not the answer was true in the context given. When the question was in the discontinuous form and the answer required the object-wide-scope interpretation (i.e. the ungrammatical type (3d)), it was expected that, if the speakers had acquired the relevant properties of these question forms, they would judge the answers false. The test included seven tokens of each of the types in (3).

The key finding was that the intermediate subjects ($n = 71$) tended to reject the discontinuous forms regardless of the answer type. By contrast, the advanced subjects ($n = 32$) differentiated between the two discontinuous forms in a target-like way: they had a statistically significantly higher rate of acceptance of subject-wide answers than object-wide answers. Dekydtspotter et al. thus concluded that, by advanced level, English speakers of French are able to acquire the *absence* of an interpretation, even though this absence is not taught and it is not presented in the input.

[2] The first answer, 'three', arises from an interpretation of the indefinite object *livres* 'books' below the scope of the universal quantifier *tous* 'all' (i.e. 'for every student, how many books is he/she buying?'; narrow scope of the object), while the second answer 'two' arises from an interpretation in which the indefinite object *livres* takes scope above the quantifier *tous* (i.e. 'for how many books is it the case that every student is buying those books?'; wide scope of the object).

[3] The 'greater than' symbol, >, is used to indicate that the element preceding > takes scope over the element following >. 'S' means 'subject' and 'O' means 'object'. Thus 'S>O answer' means 'an answer in which the universally quantified subject is understood to take scope over the indefinite object', in other words, an answer of 'three' to questions (1) and (2).

8.2.2 Marsden (2008)

Marsden (2008) also investigated universal quantifiers in questions but focused on Japanese. The question form investigated is shown in (4).

4. Nani-o daremo-ga katta no?
   what-ACC everyone-NOM bought Q
   'What did everyone buy?'

The question in (4) contains a scrambled wh-object *nani* 'what' and a universally quantified subject *daremo* 'everyone'.[4] The aim of the study was to discover whether L2 speakers of Japanese know that questions of the form given in (4) allow an 'individual answer' along the lines of 'Everyone bought books' (i.e. each person in the set under consideration bought at least one book), but they do not allow a 'pair-list answer', along the lines of 'Jane bought a book and a pen, Sam bought a book and a newspaper, Ellie bought a pen and a notebook…'. We report here on the findings from speakers with either English or Chinese as their L1.[5] English and Chinese questions with a universally quantified subject and a wh-object allow both individual and pair-list answers.[6]

Marsden used a picture-based acceptability judgement task, in which participants were presented with pictures that could support either an individual or a pair-list answer to a question with the form given in (4). Each picture was presented on a screen, with a question like (4) appearing underneath, followed by either an individual answer or a pair-list answer. Participants were asked to judge whether the answer was possible in the context of the picture and the question. The test included five tokens with individual answers and five with pair-list answers. The participants included four L2 Japanese groups, determined on the

[4] 'Scrambling' refers to optional rearrangement of the standard word order into an allowed but non-standard order. The standard word order in Japanese is SOV, and since it is a wh-in situ language, the standard form of a wh-object question is S wh-O V? In (4), the wh-object is scrambled because it has been moved in front of the subject. Marsden (2008) investigated scrambled wh-questions because the non-scrambled counterpart of the specific question type illustrated in (4) is reported to be of dubious grammaticality due to independent properties of the quantifier *daremo* (Hoji 1985; Tomioka 2007, among others).

[5] Marsden (2008) also investigates Korean-speaking learners.

[6] Tomioka (2007) proposes that the source of this variation involves crosslinguistic differences in mechanisms for expressing focus. Briefly, he argues that scrambling has the effect of focusing the scrambled element and that a focused element (here, the wh-object) cannot be interpreted under the scope of a non-focused element. Consequently, the pair-list reading cannot arise, since this reading requires a subject-wide scope interpretation. Notice that, similarly, if *everyone* receives prosodic focus in the English version of the question *What did everyone buy?* the pair-list reading is harder to obtain than with neutral intonation.

basis of their L1 and their L2 Japanese proficiency level: L1 Chinese, intermediate ($n = 10$); L1 Chinese, advanced ($n = 7$); L1 English, intermediate ($n = 21$); and L1 English, advanced ($n = 12$).

The results showed that neither of the intermediate-level L2 groups differentiated between the answer types. They tended to accept both, with acceptance rates of at least 60 % and with less than 8 % differentiation between the two types. On the other hand, the advanced L2 groups were considerably more successful in differentiating the two types, with lower rates of acceptance of the pair-list answers than individual answers (at least 30 % lower). Examination of individual results revealed that around 40 % of the subjects in each advanced group consistently rejected pair-list answers, while in the intermediate groups, fewer than 15 % consistently rejected pair-list answers.

These findings resonate with those of Dekydtspotter et al. They show that the absence of the pair-list interpretation is not easy to acquire in L2 Japanese, but by advanced level, a considerable proportion of speakers are able to acquire it. Most interestingly, they achieve this despite the lack of direct evidence about this absence, in the sources available to the learner.

8.2.3 Marsden (2009)

The final study on interpretation investigated L2 knowledge of the scope interaction of quantifiers in a declarative sentence. Again, the target language was Japanese. The investigation included sentences containing an existentially quantified subject and a universally quantified object, such as (5):[7]

5. Dareka-ga dono hon-mo yonda.
   someone-NOM every book-also read
   'Someone read every book.'

The English equivalent of (5), *Someone read every book*, allows two interpretations: a subject-wide-scope interpretation (6a) and an object-wide-scope interpretation (6b).

6. a. 'One individual read all of the books in the context.'
   b. 'For each book, some person read it (but there may be more than one individual involved).'

However, in Japanese, the object-wide-scope interpretation is absent. Thus, only interpretation (6a) is available for (5).[8]

[7] Marsden (2009) also investigated sentences containing collective universal quantifiers like 'all' as well as scrambled counterparts of (5).

[8] Marsden (2009) argues that this crosslinguistic variation may be a corollary of Japanese universal quantifiers being unspecified for number, whereas *every* in English must be [+singular].

The method was similar to Marsden (2008). English-speaking learners of Japanese (12 advanced, 19 intermediate) judged sentences like (5) in the context of pictures depicting either a subject-wide interpretation of the sentence (e.g. one person reading a pile of books) or an object-wide interpretation (e.g. four people each reading their own book). Participants were asked to rate how well the sentence matched the picture.

The results conform to the pattern of the two previous studies: the advanced speakers showed evidence of target-like rejection of object-wide scope, while the intermediate speakers' responses were more indeterminate. Specifically, half of the advanced speakers consistently rejected the object-wide-scope interpretation of doubly quantified sentences like (5), whereas only a quarter (5 out of 19) of the intermediate speakers did so. Moreover, the intermediate speakers' results were characterised by inconsistency, with eight individuals sometimes accepting and sometimes rejecting object-wide scope, whereas only one individual in the advanced group demonstrated inconsistent responses. In short, at least some of the learners were able to acquire target-like rejection of object-wide scope of a distributive QP, despite poverty of the stimulus.

8.2.4 Summary: Acquisition of Quantifier Meaning

All three of these studies show that acquisition of subtle interpretive phenomena involving quantifiers is by no means easy. Only by advanced level was there evidence of target-like knowledge. However, the fact that target-like behaviour was emerging by advanced level suggests that poverty of the stimulus can be overcome in L2 acquisition and that these subtle aspects of meaning can be acquired in a second language.

The studies presented in the next section investigate form, specifically L2 knowledge of restrictions on the distribution of the existential quantifier *any* in English (Gil and Marsden 2010; Gil et al. 2011) and of the existential use of wh-words in Chinese (Yuan 2010). The studies by Yuan and Gil and Marsden involve more poverty of the stimulus phenomena, whereas the last study, Gil et al., investigates acquisition of a property of *any* for which evidence is available in the input. In order to make sense of the studies, however, we first give details of the key properties of English *any* and Chinese existential wh-words.

8.3 Quantifiers: Acquisition of Form

The general rule for *any,* commonly found in English language textbooks and grammars, is that it can occur following (but not preceding) negation (e.g. (7)) and in questions (8a). However, it can also occur in a restricted set of non-negated contexts (e.g. 8b), but not (8c, d).

7. I didn't see anyone yesterday (cf. *Anyone didn't see me yesterday).
8. a. Did you see anyone yesterday?
   b. If anything goes wrong, call me.
   c. *I've already eaten anything (cf. I've already eaten something).
   d. *Mary is talking to anyone right now (cf. Mary is talking to someone right now).

A broad generalisation that accounts for the ungrammaticality of *any* in (8c–d) is that it only occurs in 'nonveridical' contexts, which means contexts that do not correspond to actual events, such as the negated contexts, interrogatives and conditionals (7–8b).

However, there are some exceptions to this generalisation. First, there are certain 'veridical' contexts (i.e. contexts that *can* be assumed to correspond to actual events) in which *any* is grammatical, such as after so-called downward-entailing adverbs such as *only* (9a) or in the complement clause of a negative factive verb, like *regret* (9b).[9]

9. a. Only Izzy knew anything.
   b. Sam regretted that his boss had told anyone the news.

One account of exceptions like (9a–b) is that *any* is licensed pragmatically in these environments (Giannakidou 2006). Specifically, in (9a–b) a negative inference is generated, and this 'rescues' *any* in the veridical environment.

10. a. Only Izzy knew anything. → No one but Izzy knew anything.
    b. Sam regretted that his boss had told anyone the news. → Sam wished that his boss had not told anyone.

Two more exceptions to the generalisation that *any* is grammatical in nonveridical environments can be seen in (11a–b). Both sentences are nonveridical, yet *any* is ungrammatical. The nonveridicality of (11a) comes from the adverb of uncertainty, *perhaps*, which makes the truth of the assertion unknown and hence nonveridical. In (11b), nonveridicality comes from the matrix verb *guess*, which is a nonfactive verb.[10] The assertion in the complement clause of a nonfactive verb cannot be assumed to correspond to fact.

11. a. *Perhaps Izzy knew anything.
    b. *Sam guessed that his boss had told anyone the news.

All of these examples are considered questions of form because the combination of the quantifier with particular types of verbs leads to more than a problem of meaning: the disallowed forms are ungrammatical in addition to being uninterpretable.

Chinese provides an interesting contrast; existential quantifiers in this language exhibit similarities to and differences from *any*. One of the main ways of expressing

[9] Other downward-entailing adverbs include *hardly and barely*. Other negative factive verbs include *deny*, *be sorry* and *be shocked.*

[10] Other nonfactive verbs include *believe*, *think* and *suppose.*

the sense of 'any' is through words that also function as wh-interrogatives. Thus the word *shenme* in (12) means 'what', but in (13) and (14) it means 'any(thing)'.[11] The particular meaning that emerges is determined by co-occurring morphemes. Thus, in (12), either the wh-question morpheme *ne* or the presence of question intonation determines that *shenme* is interpreted as 'what'. In (13), the *yes-no* particle *ma* determines that *shenme* becomes 'anything'. Similarly in (14), it is co-occurrence with the conditional morpheme *yaoshi* or *ruguo* that yields the existential sense 'any'. Finally, (15) is ungrammatical, because it lacks a quantifying morpheme or question marking; thus, there is nothing to determine the meaning of *shenme* (examples based on Cheng (1994) and Li (1992)).

12. Hufei chi-le shenme (ne)?
    Hufei eat-ASP WHAT WH-Q
    'What did Hufei eat?'
13. Ta mai-le shenme ma?
    he buy-PERF WHAT Y/N-Q
    'Did he buy anything?'
14. Yaoshi/Ruguo shenme ren xihuan ta, …
    If WHAT person like him
    'If anyone likes him…'
15. *Ta zuo shenme.
    he do WHAT
    ('He did something')

Clearly, this morphological property of *shenme* (and other Chinese wh-expressions) differentiates it from English *any*, since wh-interrogatives are expressed by a distinct set of words in English. However, a similarity with *any* is also evident from the Chinese data presented so far. Specifically, Chinese wh-existentials can occur in nonveridical contexts, such as interrogatives (13) and conditionals (14), but they cannot occur in veridical contexts. In fact, Chinese wh-existentials appear to be restricted strictly to nonveridical contexts, without the exceptions that we saw for English *any*. Thus, in contrast to English, they can occur in the complement clause of a nonfactive verb (16) but not in the complement of a negative factive verb (17) (Li 1992).

16. Wo yiwei/renwei/cai/xiwang ni xihuan shenme (dongxi).
    I think/think/guess/hope you like WHAT thing
    'I think/guess/hope that you'll like something/*anything.'
17. *Wo houhui zuo shenme (shiqing).
    I regret do WHAT thing
    'I regret having done something/anything.'

[11] Henceforth, we will use the term 'wh-expression' to refer to the Chinese words that can be used either as interrogatives or as existentials. When referring to the interrogative use, we use the term 'wh-interrogative', and when referring to the existential use, we use the term 'wh-existential'. When glossing wh-expressions, we will use the corresponding English wh-word sense in small caps; the translation will show the actual sense in the context.

While there is a wealth of research that seeks to account for the distribution of *any* and of Chinese wh-existentials (e.g. Cheng 1994; Giannakidou 1997, 1998, 2006; Klima 1964; Li 1992; Lin 1998; Linebarger 1980; Szabolcsi 2004; among others), it is beyond the scope of the present chapter to attempt to outline these accounts. Our chief interest is the L2 acquisition problem posed by these forms for learners of English and Chinese, as explored in the following sections.

8.3.1 Yuan (2010)

Yuan (2010) investigated L2 knowledge of Chinese wh-existentials by native English and Japanese speakers. Japanese is similar to Chinese in that it has existentials that are formed from wh-words. In Japanese, a particle is added to the bare wh-expression to form the existential. Thus, the bare form *nani* in (18) always has the sense of 'what', while *nani* in (19), with the disjunctive suffix *ka*, means 'something/anything'.

18. Nani-o katta no?
    what-ACC buy.PAST Q
    'What did you buy?'
19. Nani-ka-o katta no?
    WHAT-DISJ-ACC buy.PAST Q
    'Did you buy something/anything?'

Wh-existentials in Japanese have an unrestricted distribution. They can occur freely in veridical and nonveridical environments.

Assuming that the L1 grammar influences L2 development, the two sets of learners face different tasks. Japanese-speaking learners of Chinese must come to acquire the restrictions on Chinese wh-existentials. It might be predicted that, influenced by their L1, they would allow Chinese wh-existentials in any environment. Moreover, acquisition of the restrictions on the distribution of Chinese wh-existentials appears to be a poverty of the stimulus problem, since it involves acquiring the *absence* of a possibility that is available in the L1. Not surprisingly, Chinese language textbooks do not explicitly teach the restrictions on the distribution of wh-existentials. Considering the findings of Section 8.2, it might be expected that among the Japanese-speaking participants, only advanced learners, if any, are able to acquire the restricted distribution of Chinese wh-existentials. By contrast, for English speakers, L1 knowledge of the restricted distribution of *any* might facilitate restriction of Chinese wh-existentials. Their main acquisition task is to learn that wh-existentials are permitted in certain environments where *any* is ruled out in English (e.g. following uncertainty adverbs and nonfactive verbs). This is not a poverty of the stimulus problem: it can be acquired through exposure to wh-existentials in these contexts. Thus, in terms of L1 transfer, English speakers may have an advantage over Japanese speakers with regard to acquiring the distribution of Chinese wh-existentials.

Yuan used an acceptability judgement task to test the L2 Chinese of English and Japanese speakers, in five proficiency groups from beginner to advanced. The task included the following grammatical wh-existential sentence types:[12]

20. a. Negation + object wh-existential
    b. Nonfactive verb + wh-existential in complement clause
    c. Conditional clause containing wh-existential
    d. Subject wh-existential + *yes-no* question particle *ma*
    e. Object wh-existential + *yes-no* question particle *ma*

The ungrammatical counterparts of (20a–c) were as follows:[13]

21. a. *Subject wh-existential + negation
    b. *Factive verb + wh-existential in complement clause
    c. *Conditional clause followed up matrix clause containing wh-existential

Participants rated four tokens of each type on a scale of −3 ('completely unacceptable') to +3 ('completely acceptable'). The results for all but the advanced groups of both L1s were characterised by mean ratings of between −1 and +1, showing that in group terms, the pre-advanced speakers were unsure whether any of these sentence types were grammatical or not. However, the picture is different for the advanced groups. On the sentence types containing negation, (non)factive verbs and conditional morphemes, both advanced groups had significantly higher acceptance ratings on the grammatical types than the ungrammatical types. Only on the *yes-no* questions (20d–e) was there a difference between the two advanced groups. The L1-Japanese group accepted both *yes-no* question types (i.e. their behaviour was target-like), whereas the L1-English group rejected them.[14]

These results suggest that, below advanced level, speakers are not aware of the correct use of Chinese wh-existentials. By advanced level, however, they are generally able to differentiate between grammatical and ungrammatical uses. This suggests that the advanced speakers are aware of the dual use of wh-words and of the restricted distribution of wh-existentials. In terms of the concerns of the present chapter, the results show that structural restrictions on quantifiers—in other words, form—can eventually be acquired despite the absence of evidence for this restricted distribution in the input. Thus far, then, acquisition of form, like acquisition of meaning, appears to be possible, if only by advanced level, even in a poverty of the stimulus situation.

[12] Yuan's task included four additional sentences frames not reported here. See Yuan (2010) for details and also Gil and Marsden (2013) for discussion. The results for the five sentence frames that we focus on here are representative of the full set and suffice for the present chapter.

[13] No ungrammatical counterparts for the *yes-no* question frames (20d–e) were included.

[14] Yuan proposes that advanced English speakers' lower accuracy in the *yes-no* questions compared with the Japanese speakers may be due to the fact that Japanese, like Chinese, employs question particles in question formation (e.g. *no* in (18–19)), whereas English does not. Therefore, L1 transfer of question particles may have facilitated accuracy for the Japanese speakers on these items.

8.3.2 Gil and Marsden (2010)

Gil and Marsden (2010) investigate L2 knowledge of English *any*, by Korean-speaking learners. The acquisition task is comparable with the acquisition task faced by the Japanese-speaking learners of Chinese in Yuan (2010). Korean is another language that uses wh-expressions as existential quantifiers. Like Japanese, there are no restrictions on where wh-existentials can occur. Thus, a Korean wh-existential such as *nwu(kwu)* 'someone' is also the translation equivalent of English *anyone* in those contexts where *anyone* is grammatical (22). However, unlike English *anyone*, it can also occur in veridical contexts, such as (23) (where *nwu* cannot be translated as 'anyone').[15]

22. Nwu-ka cha-lul masiko iss-nayo?
    who-NOM tea-ACC drink PROG-Q
    'Is anyone/someone drinking tea?'
23. Nwu-ka cha-lul masiko isseyo.
    who-NOM tea-ACC drink PROG
    'Someone (*anyone) is drinking tea.'

A goal of Gil and Marsden's investigation was to find out whether Korean-speaking learners of English know that *any* has a restricted distribution. The ungrammaticality of *any* in a progressive such as the translation of (23) cannot be acquired by L1 transfer, since Korean wh-existentials are allowed in any environment. Again, as classroom instruction does not cover the restrictions on *any*, nor can restrictions be determined from the input, acquisition of the restricted distribution is a poverty of the stimulus problem for Korean-speaking learners.

The test instrument was a picture-based acceptability judgement task with *anyone* in *yes-no* questions, conditionals and progressives, the latter being ungrammatical. Each test item was viewed on a screen, accompanied by a picture that depicted one person or more doing the activity that was mentioned in the test sentence. Twenty-two upper-intermediate and advanced-level Korean-speaking learners of English rated each sentence in terms of its acceptability.

The results showed that the participants accepted *any* in all three contexts over 75 % of the time. On the progressives, the rate of acceptance was 82.7 %. Thus in general, the participants appeared to be unaware that *any* has a restricted distribution. However, investigation of the response patterns of individual participants revealed that two of the 22 participants consistently rejected the progressive test items. These two individuals appear to have overcome the poverty of the stimulus problem and acquired the relevant restriction on *any* (at least for progressive sentences). Closer inspection revealed that these two individuals had had longer exposure to English than the others: one had entered UK education in her early teens and lived in the UK for 6 years; the other arrived in the UK much later but had lived in

[15]The question in (23) can also have the meaning 'Who is drinking tea?' depending on the intonation (Jun and Oh 1996).

the UK for 10 years. The majority of the participants in the study had had just one year's residence, with some exceptions having 4–5 years' residence. The distinctive performance of the two successful participants thus might be related to their prolonged (and early) exposure to L2 input.

Although only two learners in this study demonstrated knowledge of quantifier distribution, the general pattern is nonetheless similar to that of the Japanese-speaking learners of Chinese in Yuan (2010). In both studies, knowledge of the restricted distribution of existentials was acquired, despite the absence of evidence, by a minority of the participants in the study.

8.3.3 Gil et al. (2011)

The final study in this section investigated L2 knowledge of English *any* by upper-intermediate and advanced-level Chinese-speaking ($n = 11$) and Arabic-speaking learners ($n = 15$). In this case, there was no poverty of the stimulus problem, and the results showed that none of the participants had target-like knowledge of the properties of *any* investigated.

As with the other studies, participants judged the acceptability of sentences containing ungrammatical instances of *any* in nonveridical contexts (e.g. 24b–c) and grammatical instances of *any* in contexts that give rise to negative inference (e.g. 24d–e).

24. a. Progressive, for example, *Anyone is singing.
    b. Episodic, for example, *Anyone sang.
    c. [*Even N… any…*], for example, *Even Sam saw anyone.
    d. [*Only N… any…*], for example, Only Sam saw anyone.
    e. Negative factive, for example, Bill regretted that Sam had seen anyone.

As noted above, Chinese wh-existentials are ungrammatical in veridical contexts equivalent to (24a–c). They are also ungrammatical in those veridical contexts where *any* can be rescued by negative inference, such as (24d–e). Therefore, Chinese-speaking learners of English might be predicted to reject *any* in veridical contexts (24a–c), facilitated by L1 transfer. However, L1 transfer might also mean that they have difficulty accepting *any* when it is grammatical in a veridical environment (24d–e). Arabic also has an existential quantifier *aiya* with a distribution that is largely restricted to nonveridical contexts, but it is reported to be compatible with contexts like (24d–e). Thus, Arabic-speaking learners of English may be facilitated by their L1 in producing target-like judgements of all the sentence types in (24).

The results in fact did not reveal any difference between the two L1 groups in terms of sentence type. Instead, a cross-L1 pattern was found, whereby both sets of participants tended to reject both the ungrammatical and the grammatical sentences containing *any*. Moreover, examination of the responses of individual participants revealed that no individual demonstrated consistent target-like rejection of ungrammatical tokens combined with consistent target-like acceptance of grammatical

tokens. Acquisition of the grammatical uses of *any* where it is licensed by negative inference thus appears to be difficult, regardless of L1. In this case, the difficulty is not due to poverty of the stimulus, because clearly the learners could potentially encounter examples of *any* such as (24d–e) in the input. It is interesting to note that the difficulty in this case relates to pragmatic licensing of a quantifier. The syntax-pragmatics interface has already been identified as an area of potential difficulty in L2 development (e.g. Sorace 2011; Sorace and Filiaci 2006; Tsimpli and Sorace 2006). We will return to this point in Section 8.4.

8.3.4 Summary

As in Section 8.2, a key finding from the studies in the present section is that the properties of quantifiers are not easy to acquire, but that in many cases they can eventually be acquired, even under poverty of the stimulus. Specifically, for the Japanese-speaking learners of Chinese in Yuan (2010) and the Korean-speaking learners of English in Gil and Marsden (2010), acquisition of the restricted distribution of existential quantifiers was identified as a poverty of the stimulus problem because, in the respective L1s, existential quantifiers can occur freely and because the input that the learners encounter does not provide direct information about where existentials are ungrammatical. Nonetheless, in both studies advanced learners (albeit only two, in Gil and Marsden) were able to correctly accept the grammatical forms and correctly reject existentials in veridical contexts. However, a new finding in the present set was that learners were unable to acquire the exceptional licensing of *any* by negative inference.

If the results of Sections 8.2 and 8.3 suggest that both meaning and form can eventually be acquired, we now turn our attention to what this means in terms of language pedagogy. We suspect that many teachers would be dissatisfied by advice to simply wait for the eventuality of acquisition. The obvious question for language teaching is whether L2 development can be 'speeded up' by explicit instruction. We explore this and other implications of research on quantifiers in the next section.

8.4 Implications for the Language Classroom

That the existing studies on the L2 acquisition of quantifiers show eventual acquisition of both meaning and form is perhaps not surprising, given the impossibility of separating meaning and form. A recent proposal by Slabakova (2008) also addresses meaning and form, observing that within L2 knowledge, meaning seems to come 'for free', whereas the properties of one particular type of form—functional items—are hard earned and prone to fossilisation. The complex morphosyntactic properties of functional items like quantifiers are argued to be a 'bottleneck' which holds

learners back from native-like knowledge. However, once this bottleneck is overcome, other phenomena that are regulated by the morphosyntactic properties in question seem to be acquired automatically. The poverty of the stimulus studies reported above are examples of learners acquiring target phenomena for free, in the sense that underlying knowledge seems to have arisen without any kind of specific intervention other than exposure to target language input.

Curiously however, in Gil et al. (2011), we saw failure to acquire a target language phenomenon, even though direct evidence of the particular phenomenon—licensing of *any* by negative inference—is available in the input. As already observed, this particular phenomenon concerns the interface of morphosyntactic (or lexical) knowledge with pragmatics, if we assume (following Giannakidou 2006) that the 'rescuing' of *any* by negative inference is due to inherent lexical properties of *any* that allow the pragmatic context to license it. This means that the task for these learners involves acquisition of a new lexical feature and the interaction of this feature with pragmatics. Another area of difficulty for L2 learners is the syntax-pragmatics interface, providing a potential explanation for this result. However, the phenomenon investigated in Marsden (2008) also involved the syntax-pragmatics interface, with the syntactic operation of scrambling interacting with pragmatic focus, and at least some of the learners in that study successfully acquired the target phenomenon (absence of pair-list readings in L2 Japanese). Thus, it is not the case that all L2 syntax-pragmatics interface phenomena are unacquirable.

Returning to Gil et al. (2011), with both the acquisition of morphosyntactic properties and the acquisition of syntax-pragmatics interface phenomena identified as areas of particular difficulty in L2 acquisition, it is perhaps unsurprising that, of all the quantifier-related phenomena reviewed in this chapter, acquisition of the licensing of *any* by negative inference is the one where no learners were successful. Slabakova suggests that if L2 acquisition of the morphosyntactic properties of functional items is a bottleneck, then a possible implication for language pedagogy could be that teaching could help to overcome the bottleneck. In other words, it may be that drawing explicit attention to the specific linguistic properties in question may lead to L2 development.[16] As Carroll (2001) points out, findings from research designed to test the effect of explicit grammar instruction 'provide some evidence that metalinguistic instruction has a definite effect on learner behaviour' (pp. 312–3), but it is unclear whether instruction can actually lead to restructuring of the underlying L2 knowledge or whether any positive effects are retained beyond the short term (see also Schwartz and Gubala-Ryzak 1992). In hopes of exploring the role of explicit instruction in SLA, the next section reports on an attempt to enhance the acquisition of *any* through teaching.

[16]There is, of course, debate within theoretical SLA research over whether metalinguistic knowledge can ever affect a learner's unconscious linguistic knowledge of the L2 (Schwartz 1993, among others). This debate requires philosophical discussion of the nature of knowledge beyond the scope of this chapter.

8.4.1 Testing the Effects of Instruction: Gil, Marsden and Whong (To Appear)

Two participant groups in the study included an instructed group who received instruction about *any* (detailed below) and a control group, who received none. The participants were upper-intermediate/advanced-level L2 English speakers much like those in Gil et al. (2011); they were all in the first term of a master's degree in the UK and had recent IELTS scores of 6.0 or higher. The instructed group included 15 native Chinese speakers; the 8 control group participants were native speakers of Chinese ($n=3$), Arabic ($n=3$), Balochi ($n=1$) and Indonesian ($n=1$).[17]

There were two instruction sessions, embedded within linguistics classes where the topic of *any* was relevant to the linguistic content of the class. At the first, explicit instruction was given about grammatical use of *any* in nonveridical contexts (interrogatives, conditionals), about ungrammatical use of *any* in veridical contexts (episodics, progressives) and about the cases in which *any* can occur exceptionally in veridical contexts when licensed by negative inference. Exercises were provided for practice and included lexical items that had not been used in the instruction. The second instruction session took place two weeks later. All of the points from the first instruction were reviewed, and learners were asked to think about how existential quantifiers are expressed in their L1 and whether constraints apply like those that apply to *any*. Four weeks after the second teaching session, the participants completed Posttest 1. This was the same judgement task that was reported in Gil et al. (2011). The same test was then taken again, five months later, as a delayed posttest, Posttest 2. The control group took Posttest 1 and Posttest 2 at the same times as the instructed group.

The results from the previous study, Gil et al. (2011), showed that Chinese-speaking learners of English are likely to have high rates of target-like rejection of *any* in episodics, but that they have difficulty accepting *any* in grammatical contexts where it is licensed by negative inference. The analysis of the data in Gil et al. (to appear) thus focuses on whether the learners differentiate between the following two pairs of sentence types:

25. a. *[nonfactive verb … […*any*…]] vs. *[negative factive verb … […*any*…]]
    b. *[*Even NP … any …*] vs. [*Only NP … any …*]

The results showed that, at Posttest 1, the instructed group differentiated significantly between both pairs in (25), with significantly higher rates of acceptance in both of the grammatical conditions compared with the ungrammatical conditions. The control group also had statistically significant accuracy on the test types in (25b), but made no significant differentiation between the types in (25a). However, in both groups, rates of acceptance in the grammatical conditions were nonetheless

[17] Each group was a subset of the members of two different classes, each with 18 students. However, some members of each class could not be included in the groups because of absence, especially at testing sessions.

Table 8.1 Accuracy rates[a] on grammatical and ungrammatical sentence types containing *any*

Type	Instructed (L1 Chinese)		Uninstructed control (L1 mixed)		Uninstructed comparison (L1 Chinese)
	Posttest 1	Posttest 2	Posttest 1	Posttest 2	
*nonfactive V… *any*	66.67	62.22	66.67	62.22	73.33
neg. factive V … *any*	51.11	47.48	41.67	47.92	39.17
**Even* NP … *any*	82.22	71.11	83.33	91.67	73.33
Only NP … *any*	33.33	33.33	29.17	20.83	30

[a]For the grammatical test types, 'accuracy' is the rate of acceptance, while for the ungrammatical test types, 'accuracy' is the rate of rejection

rather low (<52 %), and, at Posttest 2, neither group differentiates significantly between either of the pairs in (25). Table 8.1 (adapted from Gil et al. to appear) shows the accuracy rates of both experimental groups on all four types in (25) in both posttests and compares these with the accuracy rates on the same types by a group of 20 Chinese-speaking learners of English comprising the 11 learners whose data were reported in Gil et al. (2011), augmented with data from an additional nine proficiency-matched learners.[18]

It is clear from Table 8.1 that all three learner groups demonstrate a similar pattern: higher accuracy in rejecting the ungrammatical types than in accepting the grammatical types. In other words, there is a tendency to reject *any* in all environments. However, Gil et al. (to appear) report that there was no significant difference between the instructed group and the control group. Thus, it appears that explicit grammar teaching did not affect the learners' competence with regard to recognising the licensing of *any* by negative inference, at least not for the participants in this pilot study.

8.4.2 Second Language Acquisition and Language Teaching

The null result in Gil et al. (to appear) is clearly disappointing from the point of view of teaching. This endeavour to find ways to facilitate acquisition of one problematic area of L2 development has not shown that explicit teaching is the answer, with no clear evidence of L2 development in either the short or longer term. However, we will argue that there are still implications to be drawn for language teaching and reasons to be positive about directions that may grow out of this study.

Echoing the core agenda of generative SLA, we start with the consistent finding that very subtle properties of language can be acquired in time, as evidenced by the results of the advanced learners in SLA studies on quantifiers reported in Sections 8.2 and 8.3 and as central to Slabakova's Bottleneck Hypothesis. In terms of generative

[18]None of these 20 Chinese-speaking learners had received explicit instruction about *any*, of the type received by the instructed group.

theory of SLA, this can be taken as evidence for L2 acquisition being guided by UG. However, we see this finding as also providing strong support for the currently accepted communicative language teaching (CLT) approach to language teaching (irrespective of one's view about the role of UG in L2 acquisition). While CLT has usually been associated with functionalist approaches, the formalist research also points to the conclusion that a meaning-based approach is the correct way to teach language. This is especially true in CLT classrooms which provide large quantities of rich, authentic input. Moreover, if, as indicated in the above pilot study, subtle aspects of language cannot be acquired via instruction, then surely an approach which emphasises not only meaning but the active involvement of learners in language activity is the correct way forward, broadly speaking. This stands in stark contrast with some early generative-inspired attempts to teach learners the intricate structural properties of language (e.g. Thomas 1965; Rutherford 1968).

Going beyond this very general implication, however, is the more interesting question of how the successful learners managed to acquire the relevant interpretive phenomena despite poverty of the stimulus. Another way to consider this is to ask what, in the input, could trigger restructuring of a learner's L2 grammar such that knowledge of subtle phenomena like quantifier interpretation automatically arises. Consider, for example, the case of acquisition of the absence of pair-list readings in Japanese questions with a wh-object and quantified subject (Marsden 2008). It was proposed that the pair-list reading is suppressed due to the focusing effect of the syntactic operation of scrambling (Tomioka 2007; see footnote 5, above). If this account is correct, then we might hypothesise that increased exposure to input containing scrambled sentences could lead to earlier acquisition of the restricted interpretation of the Japanese questions, a hypothesis that could be tested in a classroom context. Findings of such a study in conjunction with similar studies of classroom interventions in relation to other poverty of the stimulus phenomena could potentially lead to a greater understanding of how learners acquire knowledge for which there is no direct evidence in the input—to the benefit of both theoretical SLA research and language pedagogy research.

One difficulty that needs to be overcome in any such research, however, is the fact that classroom research is fraught with methodological challenges. You will have noticed methodological weaknesses in the Gil et al. (to appear) study. The majority of these are a result of the fact that research must respect the pedagogical needs of classrooms as a priority. The realities of the classroom inevitably lead to less than ideal experimental conditions, such as differences in numbers of students and student backgrounds. Moreover, the need for multiple input and testing sessions is almost always going to result in reduced numbers as not all students attend all sessions all the time. These challenges say nothing about the commitment of individual students on different days nor the ability for teachers to carefully follow the requirements preferred by the researcher. Added to these classroom-based constraints are other more theory-related questions such as what qualifies as relevant input and how much relevant input is necessary.

Research methodology is one area where collaboration could be fruitful; generative SLA might look to other non-generative SLA paradigms which have much

experience in classroom research. In their extensive meta-analysis of research on L2 instruction, Norris and Ortega (2000) explore the methodological challenges that classroom research poses. But the need for collaboration goes beyond just questions of method. Any development of instruction-based research within generative SLA ought to engage with the large body of existing research on grammar instruction. While that research tends to ask questions of how to teach, with a focus on differences between implicit and explicit or inductive or deductive approaches, the fact that the object of research is grammar means that it is directly relevant to the kinds of questions posed in the classroom research discussed in this chapter. One contribution that generative SLA could make to this research agenda is in its approach to grammar. As noted by Spada and Tomita (2010) in their meta-analysis, researchers often overlook the potential differences between different types of linguistic forms under investigation, making it difficult to draw credible generalisations about the effectiveness of grammar instruction. Thus, both strands of research have much to gain from a more collaborative approach to questions of L2 development.

8.5 Conclusion

We began this chapter with very broad questions of form versus meaning, reviewing a number of studies investigating L2 knowledge of quantifiers which showed evidence of acquisition of both form and meaning. One main question was whether poverty of the stimulus can be overcome in L2 development. Our overall finding has been that though properties of quantifiers are not an easy area for L2 learners, in most cases there is evidence that they can eventually be acquired by advanced learners despite the lack of direct evidence from the L1, from L2 input or from classroom instruction. However, some properties seem to be more readily acquired than others, with particular difficulties with functional items which seem to act as a kind of 'bottleneck' as well as difficulties at the interface of syntax and pragmatics. The final study reviewed in this chapter, the classroom intervention study by Gil et al. (to appear), was not able to show positive effects from instruction on pragmatic licensing of *any*. Nevertheless, we are persuaded that there exists an open opportunity for mutually beneficial collaboration between SLA researchers and language pedagogy researchers who share concerns about the effectiveness of grammar instruction in the language classroom, an opportunity with much potential for language teaching professionals.

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