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The meaning of negation in the second language classroom: evidence from *any*

Abstract

This paper brings together an experimental study involving L2 knowledge of negation in English and an analysis of how English language textbooks treat negation, in order to consider whether textbook explanations of negation could better exploit linguistic insights into negation. We focus on the English negative polarity item *any*, whose distribution is contingent on negation, whether through the explicit negator *not* or through lexical semantic negators (e.g., *hardly*). Our experiment compares Chinese-speaking learners with existing data from Arabic-speaking learners, and finds notably lower accuracy on *any* with lexical semantic negators in both groups. Our textbook analysis reveals an approach to negation that is limited to form, focusing on the explicit negator *not* without explicit treatment of other types of negation. We propose that emphasising the meaning of negation, with explicit treatment of the full range of negative forms could facilitate more complete acquisition across a range of grammatical properties where negation plays a core role.

Introduction

Negation is an essential part of everyday communication. It is, in the words of Horn (2011, p.1), 'what makes us human, imbuing us with the capacity to deny, to contradict'. Further, as Dahl (1979) observes in his linguistic typology of negation, there is substantial cross-linguistic evidence to suggest that grammatical negation is a universal category. This universal category finds expression in a range of linguistic forms. In English, for example, it can be expressed with a morphologically explicit negator, *not*, or with other implicitly negative words, such as *hardly* and *deny*. In addition to being universal, negation has grammatical significance that dictates the distribution of a range of grammatical expressions, including the quantifier *any*.¹

(1) John did not eat anything for lunch. (Cf. *John ate anything for lunch.)

(2) Mary hardly touched any food at dinner. (Cf. *Mary touched any food at dinner.)

In (1) and (2), the presence of negation licenses *any* as long as *any* appears under the scope of negation. Notice that in syntactic terms, the explicit negative expression *not* and the implicitly negative lexical item *hardly* do not differ: both license *any*, which, due to its sensitivity to negation, is referred to as a Negative Polarity Item (NPI).

¹ Asterisks * indicate ungrammaticality.

Early research on negation in language acquisition was limited to research on the explicit negator *not*, with a large body of research showing that development of negation goes through systematic stages as evidenced through word order placement of the explicit negator, with discussion of how these stages compare in first language acquisition (e.g., Bellugi 1967, Hyams 1986) and second language acquisition (e.g., Cancino, Rosansky & Schumann 1978, Wode 1981).

Little subsequent language acquisition research has focused on negation, although our own recent research, through its focus on the negative polarity item (NPI) *any* in second language acquisition, contrasts knowledge of the properties of the explicit negator *not* with that of lexical items that are implicitly negative (Author et al., in press). Briefly (with detail to follow in the next section), this research reveals that the acquisition of the NPI-licensing ability of the two types of negator does not proceed in parallel for second language learners. Our attempts to make sense of this finding left us wondering what classroom learners are taught about negation. After all, there is ample research that shows the benefit of explicit grammar instruction for language learning (Norris and Ortega 2000, 2001; Mackey and Good 2007; Spada and Tomita 2010). However, we were unable to find any research on the effectiveness of teaching English negation specifically. Our study (in press) found the most robust knowledge of *any* in those contexts that are typically presented in textbook

explanations of *any*, which invariably refer to the use of *any* in sentences negated with *not*, and in questions. A goal of the present paper is to look at the presentation of negation in English language textbooks more broadly, including both explicit negation and lexical semantic negation, as well as presentation of the relationship between *any* and negation, in order to better evaluate the relationship between textbook explanations and learner knowledge of negation. Moreover, because the research reported in Author et al. (in press) was limited to a linguistically homogeneous set of native Arabic speakers, this paper also expands beyond that research to present data collected using the same instrument (an acceptability judgement task: AJT), but from Chinese speakers of English, whose L1 is typologically different from Arabic. This allows us to determine whether the initial findings were specific to Arabic speakers or more generalizable.

Admittedly, language teaching depends on a much wider range of factors than teaching materials, including social and political context, pedagogical assumptions about teaching, and cognitive constraints on language development. Within the latter category, the approach to second language acquisition that assumes a formal, generative linguistic orientation to the properties of language has, in the bulk of its research, abstracted away from the language classroom. The work in the present paper belongs to a new line of enquiry within formal generative second language

acquisition (GenSLA), in which GenSLA researchers engage in research on and in the language classroom (Whong et. al., 2013). It differs from the large body of research on explicit instruction such as that included in the meta-analyses by Norris and Ortega (2000, 2001), Mackey and Goo (2007) or Spada and Tomita (2010), by taking into account the nature of particular linguistic properties of language,² rather than focusing on the way language has been taught. Specifically, this study is part of a larger project that explores the relationship between learner performance on a given linguistic property of the L2 and the corresponding rule (if any) given in pedagogical grammars. Negation and the NPI *any* were chosen as the focus of research because the full range of contexts where *any* can and cannot be used in English is wider than what is covered by the generalized grammatical rule in pedagogical grammars. This allows for investigation of the development of L2 knowledge in terms of what is taught and of what is beyond the taught content.

The goal of the paper is thus to bring together experimental data on L2 knowledge of negation and survey data on the presentation of negation in English language textbooks, in order to consider whether the latter shed light on the former, and whether textbook explanations make optimal use of linguistic insights into

² We note that Spada and Tomita (2010) considered linguistic properties in their meta-analysis of the effectiveness of grammar instruction, but see Whong et al. (2014) for a criticism of the conceptualization of linguistic properties in that paper.

negation. We begin by illustrating the linguistic properties of *any*, and showing how they are inherently tied to the grammatical properties of negation. This is followed by an overview of Arabic-speaking learners' knowledge of the NPI *any* (Author et al., in press), followed by our new data on Chinese-speaking learners' knowledge of *any*, and our analysis of the presentation of negation and *any* in English language textbooks. We bring the two sets of findings together in a discussion that considers implications for classroom teaching.

Background Research

Linguistic properties of 'any' and negation in English

Negative polarity items—that is to say, expressions whose distribution is limited to some sort of negative environment—are crosslinguistically widespread. NPI *any*, in English, has seen much attention from linguists in order to capture the precise nature of the licensing condition for NPIs. Referred to as downward entailment (von Stechow, 1999; Ladusaw, 1980a, 1980b, 1996; among others), the licensing condition, simply put, is that English NPIs must occur under the scope of negation (i.e., preceded by negation). This condition leads to the following contrast in grammaticality:

- (3) John did not eat any cake at the party.

(4) *Anyone did not eat a cake at the party.

In (3) *any* occurs under the scope of the negative operator, *not*, whereas (4) is ungrammatical because *anyone*, in subject position, occurs outside the scope of negation. As mentioned in the introduction, the negative licenser of *any* is not limited to the explicit negator *not*. Negative factive verbs, which entail a negative pragmatic inference (e.g., *regret*, *deny*), can also license *any* in an embedded clause (5a) (Xiang, Grove & Giannkidou, 2015). Similarly, negative adverbs (e.g., *hardly*, *seldom*) can license *any* (6a).

(5) a. John regrets that he ate anything at the party.

→ John wishes that he had *not* eaten anything at the party.

b. *John thinks that he ate anything at the party

(6) a. John hardly ate anything at the party

b. *John probably ate anything at the party.

In (5a), though the semantically negative factive verb *regret* does not include the explicit negator, it triggers negative inference over the embedded clause, thereby licensing *any*. In contrast, non-factive verbs such as *think* in (5b), lacking negative

entailment, cannot license *any*. Similarly, even though adverbs such as *hardly* in (5a) do not contain the explicit negator, they behave like *not* in that they can license *any*. In contrast, possibility adverbs such as *probably* in (6b), do not license *any* as such adverbs do not contain any negative component. We will refer to negative expressions such as those in (5a) and (6a) as lexical semantic negation, in contrast with *not*, explicit negation, from here on.

Though this paper focuses on negation, it is important to point out that *any* is not just limited to negative environments; it is sensitive within a wider environment to non-veridical contexts (Giannakidou, 1998, 2001; Zwarts, 1996). Non-veridical contexts are sentences in which the semantic proposition does not correspond to an actual event. For instance, *any* is possible in questions (7), but it is not allowed in affirmative declarative sentences (8):

(7) Did John know anyone at the party?

(8) *John knew anyone at the party

The term “affective polarity item” is given to *any* as a superordinate term to characterize the wider distributional properties of *any*.³

Syntactic accounts of the distribution of *any* (and other affective polarity items) appeal to the syntactic notion of feature agreement (Chomsky 1995; see Adger 2005 for an accessible account), whereby a syntactic feature, or set of features, borne by the item is licensed by a corresponding feature borne by a syntactic operator within the clause. We will refer to the relevant feature on *any* as an NPI feature in this paper (as proposed by Szabolcsi 2004; Gil & Marsden 2013 and Tubau 2008 make similar proposals that appeal to a nonveridical feature or a polarity feature, respectively). Simply, the NPI feature of *any* is licensed by a negative operator that is introduced into the clause by a negator—whether an explicit or an implicit negator. In terms of acquisition, to acquire the distribution of *any*, a learner must (unconsciously) create a representation of *any* that bears the NPI feature and match the corresponding licensing feature borne by negation in the sentence in order to establish the dependency relationship between the two.

Among the properties of *any* presented above, it is the negation-related properties shown in (3–6) that we focus on in our experiment (reported below), with

³ There is another subtype of the affective polarity item *any*, namely “free choice” *any*, as in *Anybody can come to the party*. In this sentence, *any(body)* has the sense of ‘everybody’, unlike in examples (1-8) where *any* receives the existential reading ‘some...’. We do not consider free choice *any* in this paper, because its distribution is not sensitive to negation.

the environments illustrated in (7–8) serving as control properties for comparison with the negative environments. In the next sub-section, we outline the findings of the study of Arabic-speaking learners (Author et. al. in press).

L2 knowledge of ‘any’ by Arabic speaking learners of English

Author et al. (in press) investigated L2 knowledge of *any* by Najdi-Saudi Arabic-speaking learners of English (henceforth Arabic speakers), asking to what extent L2 learner knowledge of where *any* can and cannot occur reflects elements of the input learners receive, including grammar explanations in textbooks. Author et al. noted that textbooks typically include a rule to the effect that *any* is used in negated sentences and questions. The test instrument, a paced AJT which we detail in the following section, was designed to explore the development of L2 knowledge of the distribution of *any* in three categories defined in relation to potential input: those that are covered by the typical textbook rule (negation by *not*, and questions), those that are not covered by the rule but may be observable in incidental input (such as *any* licensed by implicitly negative verbs and adverbs, as illustrated previously in (5a) and (6a)), and those that are “unobservable” due to falling outside textbook explanations and to being ungrammatical hence not present in incidental input (such as the ungrammaticality of *any* following a nonfactive verb (5b) or a possibility adverb (6b)).

Findings were reported from 86 L2 speakers, divided into three proficiency groups (low intermediate, n=28; high intermediate, n=33; and advanced, n=25) on the basis of a cloze test. On *any* in environments that are explicitly captured by the grammatical rule (negated sentences and questions), the L2 speakers at all proficiency levels showed clear target-like performance. Turning to environments that are not captured by the pedagogical rule, rates of target-like acceptance of the grammatical and rejection of the ungrammatical were much lower in general. However, there was clear evidence of the emergence of target-like knowledge in the advanced group, even on the unobservable properties of *any* (i.e., ungrammatical instances of *any*). Moreover, 15 of the 86 participants (10 in the advanced group) were consistently accurate in accepting grammatical and rejecting ungrammatical items of all types. At the same time, the results gave us no reason to suspect an L1 effect: the Arabic NPI equivalent of *any* has a largely similar distribution to English *any*, yet there was apparently no facilitative effect of this when it came to the items with lexical semantic negators rather than explicit *not*, or to the ungrammatical items.

In addition to the AJT, Author et al. asked their participants to respond to a question about their conscious knowledge of a pedagogical rule or rules for *any*. The majority (78%) wrote that they did not know of a rule. Among those who claimed to know a rule, 10% referred to negation and questions, while 12% proposed irrelevant

and sometimes wrong factors, such as the (in)compatibility of *any* with count/uncountable nouns, or categorical collocation rules (e.g., '*any* is an adverb, so it comes after verbs').

Putting these results together, Author et. al. (in press) support the view that while the learners' performance is compatible with an effect of the pedagogical rule, retaining the rule in memory does not appear to affect the ability to respond correctly in contexts that are covered by the rule (i.e., learners had the highest rates of target-like judgements on *any* in negated sentences and questions even though they couldn't articulate a pedagogical rule that refers to *any* in these contexts). At the same time, the paper contends that it is possible to acquire knowledge of properties of *any* that are not taught, and not even observable.

Though we were not testing for L1 influence in Author et al., we also had no way of ruling it out. The next section reports on an additional study using the same AJT, but with Chinese-speaking learners, in order to find out whether a different learner group, whose L1 is typologically unrelated to Arabic, is equally impervious to L1 transfer effects, and rather, equally prone to high accuracy with explicit negation but lower accuracy with lexical semantic negation.

The experimental study of Chinese-speaking learners of English

Chinese also has NPIs. In Chinese, the NPIs that correspond to English *any* are *renhe* and *wh*-quantifiers (e.g., *shenme*, which means ‘what’, ‘anything’, or ‘something’ depending on the grammatical environment). The distribution of these NPIs is broadly similar to English *any* but with some notable differences. In terms of the similarities, following Cheng and Giannakidou (2013) and Wang (1993), among others, Chinese NPIs can occur following, but not preceding, explicit negators (cf. grammatical *any* following *not* in (3) but ungrammatical *any* preceding *not* in (4)). They can also occur in questions (cf. (7)) but not in affirmative declaratives (cf. (8)). However, it is in lexical semantic negator contexts (equivalents of (5) and (6)), that they display subtle differences from English. Chinese *renhe* behaves similarly to *any* with semantically negative adverbs, but not with negative factive verbs such as *houhui* ‘regret’, which do not license *renhe* (Li, 1992; Wang and Hsieh, 1996). Chinese *wh*-quantifiers are also not licensed by negative factive verbs, but they differ from *renhe* and from English *any* in that they can occur after possibility adverbs (Li, 1992; Wang and Hsieh, 1996). Table 1 provides a summary of the distributions of English *any* and Chinese *renhe* and *wh*-quantifiers, in relation to the environments to be investigated.

Table 1

While the grey cells in Table 1 show much similarity, the main difference between English and Chinese concerns negative factives (e.g., *regret*): these verbs license *any* in English but do not license either Chinese NPI. Thus, L1 transfer could lead to rejection of *any* following such lexically negative English verbs. Moreover, as seen from the results of the Arabic speakers in the previous study, licensing of *any* by lexically negative words proved difficult even when the L1 and L2 behave similarly. Thus, non-target-like judgements may be predicted for the Chinese-speaking learners particularly in the negative factive condition.

Participants

Twenty-three L1-Chinese speakers of English participated in the experiment. All were masters-level students at the start of their masters programme at a UK University. They reported IELTS scores of 6–7.5 (mean: 6.7), which classes them as “competent” or “good” users of English (IELTS, 2017). Prior to testing, they had lived in the UK for between 1 and 10 months.

A control group of monolingual native English speakers ($n = 15$) also participated in Author et al. (in press), and is reported here for comparison.

Task design

The data collection instrument was the same paced AJT used in Author et al. (in press). The AJT method was selected because it allows investigation of what learners’

grammars *disallow* in addition to what they allow, thus allowing us to examine learner knowledge of where *any* is ungrammatical. Paced AJs, which force rapid judgements based on first impressions, have been argued to provide a measure of learners' unconscious linguistic knowledge (e.g., Bowles, 2011; Ellis, 2005; Han & Ellis 1998) even though metalinguistic engagement is also required to provide a judgement on grammaticality.

Four pairs of sentence types were designed, each with a grammatical variant in which *any* is licensed, and an ungrammatical counterpart in which *any* is unlicensed. The resulting eight sentence types are illustrated in Table 2.

Table 2.

There were four tokens of each type. Thirty-two distractors (half (un)grammatical) were added to the 32 experimental items to minimize participants' awareness of the focus of the experiment. None of the distractors contained the word *any*, but they were similar in structure to the test types, exemplified as follows:

- (9) a. A king never carries his own luggage.
- b. She often watched movies.

- c. *Do you play often tennis in the summer?
- d. *I'm sorry that I was late tomorrow.

Sixteen of the distractors (8 grammatical and 8 ungrammatical) were designed to be relatively simple to judge, so that high accuracy was expected on this set. This set was then used as a measure of attention to task, with participants scoring lower than 12 out of 16 across these items being excluded from the data analysis due to possible inattention to the task

The 64 test items were divided into two sets of 32, each containing 16 experimental and 16 distractor items, and each being evenly matched for grammatical and ungrammatical items. The full set of test items is archived in the IRIS database, www.irisdatabase.org.

Procedure

Data collection took place as part of a research training class. Participants were invited to read an information sheet about the study and to sign a consent form if they wished to participate. They were free to not take part or to not submit their answer sheet if they chose.

Participants completed Set 1 of the AJT, followed by a break during which they completed a short questionnaire about their English learning history, and then Set 2.

For the AJT, participants saw each test sentence presented one by one for 9 seconds on a screen at the front of the classroom, and heard an audio-recording of each sentence as it was revealed. The audio-recordings were by a native English speaker, with prosody controlled to avoid focus on *any*. A paper answersheet provided the following options: -2, *I'm sure this is wrong*; -1, *I think this is wrong*; +1, *I think this is right*; and +2, *I'm sure this is right*. *Don't know or can't decide* was also available. The choice of a four-point scale rather than a binary scale was to encourage responses from participants who avoid categorical judgements (following Sorace 1996; Tsimpli & Dimitrakopoulou 2007; among others), and in the analysis (see below), selection of either +2 or +1 is considered to indicate acceptance, and of -2 or -1, rejection. The test items themselves were not printed on the answer sheet.

Scoring and Analysis

An accuracy score out of 4 was calculated for each type, for each participant. For grammatical items, accuracy was defined as selection of +2 or +1, and for ungrammatical, -2 or -1. *Don't know* (n=7) and missing (n=1) responses made up 0.5% of the responses counted as inaccurate (four of these, spread across four participants and four test items, were responses to experimental items). One participant was excluded from the analysis at this point due to scoring lower than 12 out of 16 on the set of distractors designed to identify possible inattention, leaving 22 participants.

Group mean accuracy scores were calculated for each type, and t-tests were run on each pair of types, to investigate identification of grammatical versus ungrammatical instances of *any*.

Results

Mean accuracies for each type are presented in Table 3, alongside the scores of native speakers of English and the “advanced” Arabic-speaking group from Author et al. (in press). Note that we cannot claim that the Chinese-speaking and Arabic-speaking groups are of equivalent proficiency, because the English proficiency measures for the two groups are different (IELTS scores for the Chinese group, cloze test scores for the Arabic group). We have selected the advanced Arabic-speaking group for comparison, because the English teachers at the Saudi Arabian university where we collected data informed us that the more advanced students from the classes who participated in the study tend to get IELTS scores in the 6–7.5 range.

Table 3.

Table 3 shows that the Chinese-speaking group obtains its highest accuracy scores (> 3.8 / 4) on the two grammatical types that are taught: 1G (*not ... NPI*) and 4G (Question). Accuracy is also high (3.36 / 4) on the grammatical 3G Negative adverb

type, but considerably lower on the remaining grammatical type, 2G Negative factive. Accuracy on all ungrammatical types is lower than on the corresponding grammatical types. T-tests comparing each grammatical-ungrammatical pair show that this is a significant difference, except on the comparison between 2G Negative factive and 2U Nonfactive, where there is no difference (Table 4). By contrast, in the native English group, accuracy is uniformly high (≥ 3.6 ; see Table 3) and there were no significant differences in accuracy within each grammatical-ungrammatical pair (Author et al., in press).

Table 4.

Individual consistent accuracy across the eight types was also calculated, with an individual being categorized as consistently accurate if she/he accepted at least 3 out of 4 of the items within each grammatical type and rejected at least 3 out of 4 of the items within each ungrammatical type. Nine of the 22 Chinese participants met this criterion. This is similar to the individual consistent accuracy in the advanced Arabic group (10 out of 25 participants) and contrasts with the native English group, among whom Author et al. report that 14 out of 15 demonstrated consistent accuracy. This sheds some light on the large standard deviations within the two L2 groups in Table 3:

within each group there was a sub-group whose responses were relatively uniformly target-like, but the remaining participants demonstrated non-target-like response patterns.

Comparison of the Chinese-English and Arabic-English results

We can observe a number of broad similarities and some interesting differences between the two L2 groups. First, in both groups, the highest levels of target-like performance (>3.6/4 mean accuracy) are evident on the grammatical *not...NPI* (1G) and Question types (4G), with lower accuracy on the grammatical lexical semantic negation conditions (Negative factive (2G) V and Negative adverb (3G)). However, while accuracy on both grammatical lexical semantic negation conditions is similar in the Arabic groups (Negative factive: 2.88/4; Negative adverb: 2.92/4), the difference between these two is much greater within the Chinese group (Negative factive: 2.23/4; Negative adverb: 3.36/4). On the ungrammatical conditions, accuracy is always lower than on the grammatical counterparts.

Like the findings from the Arabic group, the Chinese speakers' findings do not provide obvious evidence for L1 transfer, since, if transfer played a key role, higher accuracy should be evident in the identification of the ungrammatical conditions: particularly 1U *NPI...not* and 4U Affirmative Declarative, where transfer from Chinese should unambiguously lead to target-like rejection of the relevant tokens. Nonetheless,

the difference between the grammatical Negative factive and Negative adverb conditions in the Chinese group is intriguing, given that the directionality of this difference conforms to what L1 transfer from Chinese would predict. We return to this in the Discussion.

In terms of types of negator, both L1 groups have high accuracy on NPI *any* licensed by the explicit negator, and lower accuracy with lexical semantic negators (though not uniformly lower in the case of the Chinese group). However, the evidence from individual consistent accuracy across all conditions within both L1 groups shows that it is possible to acquire the relationship between negation and *any* regardless of type of negator. The following section reveals how explanations relevant to different negators and to the relationship between negation and *any* are presented in textbooks.

Analysis of textbooks

To find out how *any*, explicit negation, and lexical semantic negation are presented in English language materials, we examined 26 English language textbooks across 6 global coursebook series (*English for Life*, *English Unlimited*, *Keynote*, *New Cutting Edge*, *New English File*, *Total English*), ranging across seven levels identified within series from beginner/starter to advanced. (See Appendix for the full list and references.). We

found similar explanations with essentially the same content for each property. We present these properties in turn.

Starting with *any*, there was variation in when it was introduced, from starter level (*Cutting Edge*) to pre-intermediate (*English for Life*) to intermediate (*English File*). In most series, it was covered in more than one level. Without fail, *any* is contrasted with *some* when it is introduced (and sometimes re-introduced), and every course refers to negative sentences and questions in its description of how to use *any*, along the lines of the following from *English for Life, Elementary* p. 105: ‘We use “some” with a positive statement and “any” with negatives and questions’. Such a rule is often given in the grammar appendix rather than in the lesson that introduces *any*.

It is striking that, in addition, presentation of *any* invariably occurs in the context of explanations of countable and uncountable nouns and other quantifiers or articles. The following description, from the grammar appendix of *Cutting Edge, Pre-intermediate* p. 153, is typical: ‘We use “any” before countable or uncountable nouns in (a) negative sentences (b) questions where the answer could be yes or no’. Such descriptions are accompanied by examples, and referenced in the lesson that introduces *any* (along with other quantifiers). The lessons themselves provide exercises and activities for practice. Exercises vary from book to book, including production of *any* in a controlled free dialogue activity that targets questions using

have got (Have you got any brothers or sisters?) (e.g. *English for Life, Elementary*, p. 18), inserting *some* or *any* in a gap-fill exercise (e.g. *English Unlimited, Pre-intermediate*, p. 67), and underlining the correct alternative in sentences such as *I don't have **any time/no time** at all* (e.g. *English File, Intermediate*, p. 68).

None of the textbooks we examined provided rules for environments other than questions and negative sentences. We found one example of *any* in a semantically negative context without an explicit grammatical negator, in a gap-fill exercise where *any* was one of ten quantifiers to choose from (*Keynote, Upper Intermediate*, p. 123.) The correct insertion point for *any* was in the sentence *Then the school banned Martha from taking any photos*. This page included no explanation about *any* at all, but it referenced a grammar appendix page on which the rule 'use *any* in questions and negative forms' was given and one example each of *any* in a question and with *not* were provided (*Keynote, Upper Intermediate*, p. 160).

Turning to lexical semantic negators, we found almost no evidence of explanation of the negative meaning implicit in these forms. Some textbooks included a semantically negative adverb when presenting expressions of frequency (*hardly ever* in *New English File, Elementary* p. 33; *rarely* in *Keynote, Intermediate* p. 13), but the ability of these items to license NPIs was not touched on. The one exception was the explanation which accompanied the teaching of *hardly* in *Total English, Upper*

Intermediate (p. 115) pointing out that ‘*hardly* is often used with *any*(*thing/one/where* etc.) and *ever*’. Notably, this was included in the explanation of the use of the adverb *hardly*, not in the context of the use of *any*. No other textbooks made explicit connection between lexically semantic negative words and *any*.

Turning to how negation is presented more generally, we found that it is always introduced in the most elementary level, often in the first lesson, and through use of the verb *be* in negative contexts in contrast to the affirmative. The *English Unlimited* starter level (pp. 6–13) offers a typical example. First, it presents verbal negation with *not* in Unit 1, in a sentence-picture matching activity in which one sentence includes *I’m not married*. This is followed by table that illustrates *be married* with the subjects *I* and *we* in two columns, for the positive and negative forms. Further exercises (written gap fill, speaking in pairs) offer opportunities to practice. The unit’s review page (p. 99) illustrates *I’m not.../we’re not...* again, and makes reference to the textbook’s grammar reference section. The latter presents a table entitled ‘be PRESENT-NEGATIVE’ displaying *be* with all subject pronouns in negated sentences.

Negation with *do* in the simple present is typically presented soon after *be*. The relevant lesson tends to illustrate use of negation with *do*, with practice that may include exercises in rewriting affirmative sentences, true-false activities where false statements should be rewritten, dialogues in pairs where negated sentences may be

optionally used. Most textbooks additionally provide a summary in a grammar appendix, typically by means of a table on the simple present showing affirmative and negated forms for all pronoun subjects. Some textbooks also include a written description of how to form a negated sentence (e.g., *Total English, Elementary*, p. 33: 'Form the negative of the present simple with the verb *do + not + infinitive*').

Another negated form presented early in all courses is *can't*, introduced along with *can*. In all of the coursebooks we looked at, whenever a new verbal form is introduced (*can, must, should*, simple past, present perfect, etc.), negation of that form is presented at the same time. Grammar appendices typically illustrate the affirmative and negative forms for all pronoun subjects, for each new verb form.

Finally, none of the textbooks gave an explanation of the *meaning* of negation, whether in reference to explicit negators, or to implicit lexically semantic negation in certain verbs and adverbs. As mentioned at the outset of the paper, negation can be assumed to be a universal category across languages. Thus, language learners can presumably draw—probably unconsciously—on their existing knowledge of negation in order to understand its meaning without any explanation being required. However, in the following section, we argue that it would be useful to include explanation of the broad category of negation, incorporating explicit and implicit negation, in textbook presentations.

Discussion

Three key findings from the experimental data on *any*, across both the Chinese-speaking and the Arabic-speaking groups, were that (i) the greatest accuracy was demonstrated on *any* with explicit negation and in questions; (ii) the relationship between *any* and lexical semantic negators is harder to attain than the relationship between *any* and the explicit negator, *not*; and (iii) coming to know where *any* cannot occur is challenging. These broad findings resonate with the main observations from the textbook survey, namely that textbook presentation of the distribution of *any* is limited to the explanation that it occurs in questions and (explicit) negation; that information on the explicit negator focuses on presentation of the negated forms of verbal paradigms; and that lexically semantic negators are not identified as a category and there is no explanation of how their meaning relates to the meaning of the explicit negator. In this section, we focus on details from these findings, to propose that textbook presentations could usefully include negation as a linguistic category.

First, we return to the finding that, within both L1 groups, despite the lower accuracy on lexical semantic negation in group terms, a subset of individuals (9 out of 22 in the Chinese-speaking group and 10 out of 25 in the Arabic-speaking group) were consistently accurate across all eight types, demonstrating that (unconscious) knowledge of the relationship between *any* and the category of negation can be

acquired. Presumably—recalling the thrust of syntactic accounts of *any* outlined in Section 2—these individuals have successfully created a representation of *any* that bears an NPI feature and established a dependency relationship with a feature-matching expression (either by explicit or lexically semantic negation) higher in the sentence.

What is it, then, that shapes the performance of those who have not attained these representations? The high accuracy on explicit negation and questions but low accuracy with lexical semantic negators suggests that, whether or not they can consciously recall it, the learners' behaviour correlates with what is typically presented in teaching materials. Since we have not tested the effect of textbook exercises on knowledge of NPI *any*, we cannot claim that the textbook presentations cause the group-level partial accuracy on *any*. However, we propose that, in group terms, the learner knowledge is characterized by patterns that match the textbook generalisation (“use *any* in questions and with negation”), whereas at the individual level, a subset of learners has acquired the target syntactic representations.

Acquisition of the target syntactic representations entails knowledge that lexical semantic negators fall into the syntactic category of negation. Noting that textbook presentations omit reference to the relationship between negation and lexical semantic negators, we argue in the following—drawing on evidence from our

experimental study and our textbook survey—that it could be worthwhile including this relationship in teaching materials.

First, we return to the finding in the Chinese-speaking group, that, within the lexical semantic negation types, target-like acceptance of *any* in the Negative Adverb condition (3G) was considerably higher than in the Negative Factive Verb condition (2G). Although, in general, there was no clear evidence of L1 transfer affecting knowledge of the distribution of *any*, it is intriguing to note, recalling Table 1, that higher accuracy on the Negative Adverb condition than the Negative Factive Verb condition would in fact be predicted by transfer from Chinese. It is illuminating to consider the structure of Chinese negative adverb phrases in this context. In Chinese, a negative adverbial is often expressed using the explicit negator *bu* with an adverb, as in *jihu bu* ('almost not'):

- (10) Zhangsan jihu bu mai shenme dongxi/renhe dongxi
Zhangsan almost not buy what thing/renhe thing
'Zhangsan hardly buys anything.'

Even though English negative adverbs are classified as lexical semantic negators, strictly speaking, Chinese negative adverbs are not, as they contain the explicit negator

bu. Since Chinese learners of English are taught that *any* is grammatical following *not*, they might associate the negative adverbs with explicit negation, due to the presence of the explicit negator *bu* in Chinese. This could underpin the high rate of acceptance on the Negative Adverb condition, and it could explain the contrast between the Chinese group and the Arabic group, since Arabic negative adverbials (e.g., *belkad* 'barely') are similar to English and do not incorporate the explicit negation morpheme.

If it is correct that the higher accuracy in the Chinese group on the Negative Adverb condition is due to association (via L1 transfer) of negative adverbials with an explicit negator, then this suggests that highlighting the negative meaning of negative adverbs (and other lexical semantic negators) in teaching materials could similarly lead to higher accuracy in allowing *any* to be licensed by such forms. Moreover, it could have effects beyond *any*, as *any* is not the only word whose behaviour is dependent on the category of negation. Other expressions whose distribution relates to negation include other NPIs such as *at all* (10) and minimisers such as *a wink* (11):

(10) I did not touch / hardly touched the food *at all*. (Cf. *I touched the food at all.)

(11) I did not sleep / hardly slept a wink last night. (Cf. *I slept a wink last night.)

The meaning of negation also gives rise to subject-verb inversion with some negative adverbials:

(12) Not in a million years would I ever eat raw meat. (Cf. *In a million years would I ever eat raw meat.)

(13) Rarely did he pay anyone a compliment. (Cf. *Probably did he pay anyone a compliment.)

And negation is implicated in a core property of English, namely the requirement for auxiliary *do* in verbal negation (14):

(14) I did not take the pills last night. (Cf. *I took not the pills last night)

This evidence of a range of structures that depend on negation is our second reason for suggesting that it could be worth including the meaning of negation in textbooks. Presentation of negation as a meaning-based category could facilitate learners' development across this range of structures.

It is an empirical question—and one that we hope will be the subject of future research—as to whether or not provision of information and practice on negation as a

meaning-based category would be effective. However, what is uncontroversial is that the inclusion of the role of lexical semantic negation in textbook presentations on *any* would be truer to the full range of its use in English. We also suggest that if the textbook rule for *any* that relates to negation referred to the semantic concept of negation more broadly, instead of just to sentences with explicit negators, this might be a more economical way to capture the relevant generalization for *any*. Further, drawing attention to negation as a grammatical category might be helpful as a way of appealing to meaning as a driver of grammaticality, instead of the less meaningful tendency towards categorical collocation. Recall that in the survey of learners' conscious knowledge of rules for *any*, in Author et al. (in press), a number of respondents made irrelevant and incorrect claims about the grammaticality of *any* depending on use with mass or count nouns. From our textbook survey, it is clear why learners come to associate *any* with the mass/count distinction. While we recognize the logic of including *any* when teaching how quantifiers interact with the different noun types, the linguistic properties that dictate the rules for *any* are not, in fact, related to properties of nouns. Presentation of *any* that referred to its relationship with the broad category of negation, incorporating lexical semantic negators in addition to the explicit negator *not*, would capture its linguistic properties, and allow

possibilities for developing learners' awareness of negation as a category that plays a role in a range of structures.

6. Conclusion

This study has explored the explicit grammar rules available to students via English textbooks on the one hand, and evidence of the ability to apply the rules on the other. We have found that the meaning of negation is overlooked in teaching materials, and that the textbook rule typically given for the NPI *any*, is incomplete. Despite this, our findings from Chinese-speaking learners of English, in addition to the previous findings on Arabic-speaking learners of English, show that learners come to know more than the generalized rules available in their textbooks. We have not chosen to interpret this to mean that the inclusion of explicit rules in textbooks is unimportant. To the contrary, we suggest that textbooks might usefully include more linguistically precise explanations. In the case of the dependency between *any* and meaning of negation, such explanations could be presented as part of an integrated approach to explanations of negation more generally, where attention is drawn to both explicit and lexical semantic negators belonging to the category of negation. Whether or not such explanations could facilitate learner development more effectively than current explanations is a matter for further research to decide. We conclude by noting that the

ideal team to conduct such research would comprise both linguists and language education researchers working together.

Table 1. Summary of grammaticality in each type of context, in English and Chinese

Type		English <i>any</i>	Chinese	
			<i>renhe</i>	<i>wh-NPI</i>
Negation	Explicit negator	<i>not ... NPI</i>	✓	✓
		<i>NPI ... not</i>	✗	✗
	Lexical semantic negator	Negative factive V ... NPI	✓	✗
		Non factive V ... NPI	✗	✓
		Negative Adverb ... NPI	✓	✓
		Possibility Adverb ... NPI	✗	✓
<i>any</i> in Question		✓	✓	
<i>any</i> in Affirmative Declarative		✗	✗	

(✓=Grammatical, ✗=Ungrammatical)

Table 2. Summary of test types

Test Types			Examples
1G	Explicit Negation	<i>not</i> ... NPI	I don't want any salad today.
1U		NPI ... <i>not</i>	Anyone has not finished their homework.
2G	Lexical semantic Negation	Neg. factive V ... NPI	I regret that I told anyone about our plans.
2U		Non-factive V ... NPI	I think that our teacher told anyone about this.
3G		Neg. Adverb ... NPI	I seldom see anyone at the weekend.
3U		Possibility Adverb ... NPI	I probably saw anyone at the weekend.
4G	Question		Do you know anyone at that school?
4U	Affirmative Declarative		I've already had anything to eat today.

(G=Grammatical; U=Ungrammatical)

Table 3. Mean accuracy out of 4 for each AJT type, by the L1-Chinese learners of English, with L1 English and L1 Arabic groups from Author et al. (in press) for comparison

Sentence type	Group		
	L1 Chinese (<i>n</i> = 22)	L1 English (<i>n</i> = 15)	L1 Arabic (<i>n</i> = 25)
1G <i>not</i> ... NPI	3.91 (0.29)	4.00 (0.00)	3.68 (0.56)
1U NPI ... <i>not</i> ...	2.68 (1.13)	3.87 (0.35)	2.32 (1.38)
2G Negative factive V ... NPI	2.23 (1.11)	3.73 (0.46)	2.88 (1.09)
2U Non-factive V ... NPI	2.09 (1.30)	3.60 (0.63)	2.12 (1.42)
3G Negative adverb ... NPI	3.36 (0.85)	3.93 (0.26)	2.92 (0.91)
3U Possibility adverb ... NPI	2.41 (1.50)	3.73 (0.80)	2.52 (1.23)
4G Question	3.86 (0.36)	3.93 (0.26)	3.84 (0.37)
4U Affirmative declarative	2.86 (1.28)	3.73 (0.46)	3.08 (1.22)

Note. Standard deviations are in parentheses.

Table 4. Paired samples t-test results for each grammatical-ungrammatical pair

	df	t	p	95% CI	
				LL	UL
1G <i>not</i> ... NPI v. 1U NPI ... <i>not</i>	21	4.83	<.001	.69	1.76
2G Neg. factive ... NPI v. 2U Non-factive ... NPI	21	.36	.359	-.65	.93
3G Negative adv. ... NPI v. 3U Possibility adv. ... NPI	21	2.67	.014	.21	1.69
4G Question v. 4U Affirmative declarative	21	3.49	.002	.40	1.59

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Appendix: Textbooks included in analysis, listed by series

(New) Cutting Edge

Cunningham, S., & Moor, P. (2005). *New Cutting Edge: Intermediate, Students' Book*. Harlow: Pearson Education.

Cunningham, S., & Moor, P. (2005). *New Cutting Edge: Upper Intermediate, Students' Book*. Harlow: Pearson Education.

Cunningham, S., & Moor, P. with Comyns Carr, J. (2005). *Cutting Edge: Pre-Intermediate, Students' Book*. Harlow: Pearson Education.

Cunningham, S., & Moor, P. with Comyns Carr, J. (2003). *Cutting Edge: Advanced, Students' Book*. Harlow: Pearson Education.

Cunningham, S., & Moor, P. with Eales, F. (2005). *New Cutting Edge: Elementary, Students' Book*. Harlow: Pearson Education.

Cunningham, S., & Redston, C. with Moor, P. (2002). *Cutting Edge: Starter, Students' Book*. Harlow: Pearson Education.

English for Life

Hutchinson, T. (2007). *English for life, beginner: student's book*. Oxford: Oxford University Press.

Hutchinson, T. (2007). *English for life, elementary: student's book*. Oxford: Oxford University Press.

Hutchinson, T. (2007). *English for life, pre-intermediate: student's book*. Oxford: Oxford University Press.

Hutchinson, T. (2009). *English for life, intermediate: student's book*. Oxford: Oxford University Press.

English Unlimited

Doff, A. (2010). *English unlimited: starter coursebook*. Cambridge: Cambridge University Press.

Doff, A., & Goldstein, B. (2011). *English unlimited: advanced coursebook*. Cambridge: Cambridge University Press.

Rea, D., & Clementson, T., with Tilbury, A., & Hendra, L. A. (2011). *English unlimited: intermediate coursebook*. Cambridge: Cambridge University Press.

Tilbury, A., Clementson, T., Hendra, L. A., & Rea, D. (2010). *English unlimited: elementary coursebook*. Cambridge: Cambridge University Press.

Tilbury, A., Clementson, T., Hendra, L. A., & Rea, D. (2010). *English unlimited: pre-intermediate coursebook*. Cambridge: Cambridge University Press.

Tilbury, A., & Hendra, L. A., with Rea, D., & Clementson, T. (2011). *English unlimited: upper intermediate coursebook*. Cambridge: Cambridge University Press.

Keynote

Dummett, P., Stephenson, H., Lansford, L. (2016). *Keynote intermediate, student's book*. Andover: National Geographic Learning.

Stephenson, H., Lansford, L. Dummett, P. (2016). *Keynote upper intermediate, student's book*. Andover: National Geographic Learning.

New English File

Oxenden, C., C. Latham-Koenig, and Seligson, P. (2004). *New English File: Elementary Student's Book*. Oxford: Oxford University Press.

Oxenden, C., C. Latham-Koenig, and Seligson, P. (2005). *New English File: Pre-Intermediate Student's Book*. Oxford: Oxford University Press.

Oxenden, C., & Latham-Koenig, C. (2006). *New English File: Intermediate Student's Book*. Oxford: Oxford University Press.

Oxenden, C., & Latham-Koenig, C. (2008). *New English File: Upper-Intermediate Student's Book*. Oxford: Oxford University Press.

Total English

Acklam, R., & Crace, A. (2005). *Total English: Pre-Intermediate Students' Book*. Harlow: Pearson Education.

Acklam, R., & Crace, A. (2006). *Total English: Upper Intermediate Students' Book*. Harlow: Pearson Education.

Clare, A., & Wilson, J.J. (2006). *Total English: Intermediate Students' Book*. Harlow: Pearson Education.

Foley, M., & Hall, D. (2005). *Total English: Elementary Students' Book*. Harlow: Pearson Education.

