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

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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, finding 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 role.

Keywords

Negation, negative polarity, EFL, textbook explanations, generative SLA

Introduction

Negation is an essential part of everyday communication. It is 'what makes us human, imbuing us with the capacity to deny, to contradict' (Horn, 2011, p.1). In his linguistic typology of negation, Dahl (1979) observes 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 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).

Early acquisition research on negation 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 (e.g., Bellugi, 1967; Hyams 1986 for first language acquisition; Cancino, Rosansky & Schumann, 1978; Wode, 1981 for second language acquisition).

Little subsequent acquisition research has focused on negation. Our own recent research on 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 (Marsden, Whong & Gil, 2017). 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 & Ortega, 2000, 2001; Mackey & Goo, 2007; Spada & Tomita, 2010). However, we were unable to find any research on the effectiveness of teaching English negation specifically. Our study (Marsden et al., 2017) 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, and their relationship

with *any*, in order to better evaluate the relationship between textbook explanations and learner knowledge of negation. Moreover, because the research reported in Marsden et al. (2017) was limited to a linguistically homogeneous set of native Arabic speakers, this paper also expands that research to present data collected using the same instrument (an acceptability judgement task: AJT), but from speakers of English whose L1 (Chinese) 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 approaches, 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. This paper belongs to the line of enquiry within formal generative second language acquisition (GenSLA), in which 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 (e.g., Norris & Ortega, 2000, 2001; Spada & 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. Negation and the NPI *any* were chosen for the present study because the full range of contexts

where *any* can and cannot be used 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 explicitly presented and what goes beyond explicit exposure.

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 negation. We begin by illustrating the linguistic properties of *any*, showing how they are inherently tied to grammatical properties of negation. This is followed by an overview of Arabic-speaking learners' knowledge of the NPI *any* (Marsden et al., 2017), followed by new data on Chinese-speaking learners' knowledge of *any*, and an 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—i.e., 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 Fintel, 1999; Ladusaw, 1980a, 1980b, 1996; among others), the licensing condition, simply put, is that English NPIs must occur under the scope of negation.[3] 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 already mentioned, the negative licensor 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* (5a) (Xiang, Grove & Giannakidou, 2015), as can negative adverbs (e.g., *hardly*, *seldom*) (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.

Though the semantically negative factive verb *regret* (5a), does not include the explicit negator, *not*, it triggers negative inference over the embedded clause, thereby licensing *any.* In contrast, non-factive verbs such as *think* (5b), lacking negative entailment, cannot license *any*. Similarly, adverbs such as *hardly* (5a) also behave like *not* in terms of licensing *any*. In contrast, possibility adverbs without a negative component, such as *probably* (6b), do not license *any*. We will refer to negative expressions such as those in (5a) and (6a) as lexical semantic negation, in contrast to explicit negation (*not*), from here on.

It is worth pointing 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 not 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.*[4]

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 representations of explicit and

lexical semantic negation that bear the corresponding licensing feature. The dependency between the two can then be automatically established.

Among the properties of *any* presented above, it is the negation-related properties shown in (3–6) that we focus on in our experiment, with 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 (Marsden et al., 2017).

L2 knowledge of 'any' by Arabic speaking learners of English

Marsden et al. (2017) 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. Marsden 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 detailed 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 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-English 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. For environments not captured by the pedagogical rule, rates of target-like performance 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.

In addition to the AJT, Marsden et al. included a question about participants' conscious knowledge of pedagogical rules for *any*. The majority (78%) wrote that they did not know of a rule. Among those who claimed to know a rule, 47% referred to

negation and questions, while 53% 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, Marsden et al. (2017) 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 corresponding contexts (i.e., learners attained high rates of target-like judgements on *any* in negated sentences and questions but 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 captured in pedagogical rules, and are not even observable.

Though we were not testing for L1 influence in Marsden 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, to consider whether a learner group whose L1 is typologically unrelated to Arabic, is equally impervious to L1 transfer effects, and equally prone to higher accuracy with explicit negation than lexical semantic negation.

The experimental study of Chinese-speaking learners of English

Chinese also has NPIs; those 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 under the scope of explicit negators (cf. grammatical in (3) but ungrammatical in (4)). They can also occur in questions (cf. (7)) but not in affirmative declaratives (cf. (8)). 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. Summary of grammaticality in each type of context, in English and Chinese.

Type			English *any*	Chinese	
				renhe	*wh-NPI*
Negation	Explicit negator	*not* … NPI	✓	✓	✓
		NPI … *not*	✗	✗	✗
	Lexical semantic negator	Negative factive V … NPI	✓	✗	✗
		Non factive V … NPI	✗	✗	✓
		Negative Adverb … NPI	✓	✓	✓
		Possibility Adverb … NPI	✗	✗	✓
any in Question			✓	✓	✓
any in Affirmative Declarative			✗	✗	✗

(✓=Grammatical, ✗=Ungrammatical)

While Table 1 shows much cross-linguisitic similarity (indicated by the grey cells), 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 expected 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 Marsden et al. (2017), and is reported here for comparison.

Task design

The data collection instrument was the same paced AJT used in Marsden et al. (2017). 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 AJTs, 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.

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

Table 2. Summary of test types.

Test Types			Examples
1G	Explicit Negation	*not* … NPI	I don't want any salad today.
1U		NPI … *not*	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)

Four tokens of each type meant 32 experimental items; 32 distractors (half (un)grammatical) were added to minimize participants' awareness of the focus of the experiment. Though not containing the word *any*, the distractors 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.

Eight grammatical and 8 ungrammatical distractors were designed to be relatively simple to judge, so that high accuracy on this set could be used as a measure of attention to task; participants scoring lower than 12 out of 16 across these items were excluded from analysis due to possible inattention to task.

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

Procedure

Data collection took place as part of a research training class. Participants were given an information sheet about the study and signed a consent form if they wished to participate, with freedom to not take part or 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, each test sentence was presented for 9 seconds on a screen at the front of the classroom, with an accompanying audio-recording of each sentence.[5] The audio-recordings were by a British 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). 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 at this point due to scoring lower than 12 out of 16 on the 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 the L1 English control group and the "advanced" Arabic-speaking group from Marsden et al.

(2017). Note that we cannot claim that the Chinese-speaking and Arabic-speaking groups are of equivalent proficiency, because the English proficiency measures 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. Mean accuracy out of 4 for each AJT type, by the L1-Chinese learners of English, with L1 English and L1 Arabic groups from Marsden et al. (2017) for comparison.

	Group		
Sentence type	L1 Chinese (*n* = 22)	L1 English (*n* = 15)	L1 Arabic (*n* = 25)
1G *not* … NPI	3.91 (0.29)	4.00 (0.00)	3.68 (0.56)
1U NPI … *not*…	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 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 English control group, accuracy is uniformly high (≥3.6; see Table 3) and there were no significant differences in accuracy within each grammatical-ungrammatical pair (Marsden et al., 2017).

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

				95% CI	
	df	**t**	**p**	**LL**	**UL**
1G *not* … NPI v. 1U NPI … *not*	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

Individual consistent accuracy across the eight types was also calculated, with an individual categorized as consistently accurate if she/he accepted at least 3 out 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 English control group, among whom Marsden et al. report 14 out of 15 demonstrating 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 both broad similarities and 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. If transfer played a key role, higher accuracy should be evident in the ungrammatical conditions, particularly 1U NPI…*not* and 4U Affirmative Declarative, where transfer from Chinese should 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 individuals 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 from beginner/starter to advanced. (See Appendix for the full list.) We found similar explanations with essentially the same content for each property, presented 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 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: 'We use "some" with a positive statement and "any" with negatives and questions' (*English for Life, Elementary* p. 105). Such a rule is often given in the grammar appendix rather than in the lesson that introduces *any*.

It is striking that 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). Lessons provide exercises and activities for practice. Exercises vary, but include production of *any* in controlled free dialogue activities that target questions using *have got* (*Have you got any brothers or sisters?*) (e.g. *English for Life, Elementary*, p. 18), inserting *some* or *any* in gap-fill exercises (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 which included the rule 'use *any* in questions and negative forms' with an example of *any* in a question and *any* with *not* (*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.[6] 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, with one exception, the connection with NPIs was not touched on. The exception related to the adverb *hardly* in *Total English, Upper Intermediate* (p. 115), which points out that '*hardly* is often used with *any(thing/one/where* etc.) and *ever*'. Notably, this was explanation is in the context of the use of *hardly,* not in the context of *any.* No other textbooks made any connection between lexical semantic negators and *any.*

Looking at negation 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. In Unit 1 it presents verbal negation with *not* 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 refers to the textbook's grammar reference section, which 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 lexical semantic negation in certain verbs and adverbs. If, as mentioned at the outset of the paper, negation is a universal category, language learners can presumably draw 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- and Arabic-speaking groups, were that (i) 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 negated forms in verbal paradigms; and that lexical 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 these findings and propose that textbooks could usefully include negation as a linguistic category.

We start with the finding that, despite the lower accuracy on lexical semantic negation in group terms, a subset of individuals (9 out of 22 Chinese-speakers and 10 out of 25 Arabic-speakers) 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 have established a dependency relationship with a feature-matching expression (either by explicit or lexical 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 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, these learners' knowledge is characterized by patterns that match the textbook generalisation ("use *any* in questions and with negation"), even if the learners do not remember that they were exposed to such generalisations. To move beyond this partial knowledge of the distribution of *any* relies on acquiring representations of lexical semantic negators as

belonging to the syntactic category of negation. Noting that textbooks omit reference to the relationship between negation and lexical semantic negators, we draw on evidence from our experimental study and textbook survey to argue that it could be worthwhile including this relationship in teaching materials.[7]

First, we return to the finding in the Chinese-speaking group, that, within the lexical semantic negation types, target-like acceptance of *any* with Negative Adverbs (3G) was considerably higher than with Negative Factive Verbs (2G). Although, in general, there was no clear evidence of L1 transfer affecting knowledge of the distribution of *any*, recall from Table 1 that higher accuracy on Negative Adverbs than Negative Factive Verbs would be predicted by transfer from Chinese. Consideration of the structure of Chinese negative adverb phrases is illuminating because negative adverbials are 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, in association with 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 and Arabic groups, since Arabic negative adverbials (e.g., *belkad* 'barely') are similar to English and do not incorporate an explicit negation morpheme.

If the higher accuracy in the Chinese group with Negative Adverbs is due to association (via L1 transfer) of negative adverbials with an explicit negator, 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. Additionally, it could have effects beyond *any*, because *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.)

Negation is also implicated in the core requirement in English 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 range of structures that depend on negation is our second reason for suggesting that the meaning of negation should be highlighted in textbooks. Presenting negation as a meaning-based category could facilitate learners' development across this range of structures.

It is an empirical question worthy of future research 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. Additionally, if the textbook rule for *any* that relates to negation referred to the semantic concept of negation more broadly, this might be a more economical way to capture the relevant generalization for *any*. Drawing attention to negation as a grammatical category might also be helpful as a way of appealing to meaning as a driver of grammaticality, and reduce the less meaningful (and incorrect) tendency towards categorical collocation. Recall that in the survey of learners' conscious knowledge of rules for *any*, in Marsden et al. (2017), 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 of nouns. While we recognize the logic of including *any* when teaching about pre-nominal quantifiers (including articles and quantificational phrases), unlike expressions such as *a little*, *a few*, *many*, and *much*—which are often presented in the same section as *any*—the linguistic properties that dictate the rules for *any* are not 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 accurately 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.

Conclusion

This study has explored the explicit grammar rules available to students via English textbooks, and evidence of the ability to apply the rules. 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 previous findings on Arabic-speaking learners of English, show that learners come to know more than the generalized rules available in their textbooks. We do not interpret this to mean that the inclusion of explicit rules in textbooks is unimportant. Instead, we suggest that textbooks might usefully include more linguistically precise explanations. In the case of the dependency between *any* and the 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 an empirical question. We

conclude by noting that the ideal team to conduct such research would comprise both linguists and language education researchers working together.

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Notes

[1] Asterisks * indicate ungrammaticality.

[2] See Whong et al. (2014) for a criticism of the conceptualization of linguistic properties in the meta-analysis by Spada and Tomita (2010).

[3] The scope relation depends on the linguistic notion of c-command: *A* is under the scope of *B* if *A* is c-commanded by *B*, where "c-commanded by" means *A* is dominated by a sister constituent of *B*. This explains the ungrammaticality of (4): *any,* appearing in the subject position, is not c-commanded by *not*, and is therefore outside the scope of

negation (See Carnie (2013) for more on c-command and scope (pp. 127–128 and 402–403).)

[4] Another subtype of the affective polarity item *any* is "free choice" *any*, as in *Anybody can come to the party*, where *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.

[5] A reviewer queried whether 9 seconds was not too long to exclude participants resorting to explicit knowledge. This timing was arrived at based on piloting, and taking into account that participants in Marsden et al. (2017) included less advanced learners who would need more time for processing. We cannot guarantee that participants did not use explicit knowledge. We note, following Loewen (2009), that research is still needed to determine the optimal timing for sentence presentation in paced judgement tasks, but 9 seconds lies within the range (3–10 seconds) that Loewen found in previous studies that aimed to avoid use of explicit knowledge.

[6] It is worth noting that lexical semantic negators are not rare, or technical, vocabulary. Many are classed as high frequency words in van Heuven, Mandeera, Keuleers and Brysbaert's (2014) word frequency database (e.g., *hardly*, *rarely*, *deny, without*).

[7] In addition to possible effects of grammar instruction, it is certainly likely that frequency, at structure or word level, could play a role in the developmental pattern seen in our data. As reported in Marsden et al. (2017), research using the British National Corpus shows that around two-thirds of instances of *any* are found in negation or question structures, while lexical semantic negation accounts for only 1.8% of cases (Lin, 2015). Within lexical semantic negation, collocational strength of the lexical semantic negator with *any* could also play a role. The present study was not designed to investigate this, and in what follows, we focus on grammar instruction. However, we agree with a reviewer that, any development of teaching materials that aimed to use our grammar instruction suggestions (below) could at the same time exploit insights from research on collocations and frequency effects in language learning (e.g., Bardovi-Harlig & Stringer, 2017; Ellis, 1996, 2012). Indeed, such an endeavour would be desirable.

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Appendix: Textbooks included in analysis, listed by series

Note. The core student book was consulted in all cases, rather than any supplementary materials such as workbooks.

Cutting Edge / New Cutting Edge, Pearson Education (Harlow):

Starter	Cunningham, S., & Redston, C. with Moor, P. (2002).
Elementary	Cunningham, S., & Moor, P. with Eales, F. (2005).
Pre-intermediate	Cunningham, S., & Moor, P. with Comyns Carr, J. (2005).
Intermediate	Cunningham, S., & Moor, P. (2005).
Upper Intermediate	*as above*
Advanced	Cunningham, S., & Moor, P. with Comyns Carr, J. (2003).

English for Life, Oxford University Press (Oxford):

Elementary	Hutchinson, T. (2007).
Pre-intermediate	*as above*
Intermediate	Hutchinson, T. (2009).

English Unlimited, Cambridge University Press (Cambridge):

Starter	Doff, A. (2010).
Elementary	Tilbury, A., Clementson, T., Hendra, L. A., & Rea, D. (2010).
Pre-intermediate	*as above*
Intermediate	Rea, D., & Clementson, T., with Tilbury, A., & Hendra, L. A. (2011).
Upper Intermediate	Tilbury, A., & Hendra, L. A., with Rea, D., & Clementson, T. (2011).
Advanced	Doff, A., & Goldstein, B. (2011).

Keynote, National Geographic Learning (Andover).

Intermediate	Dummett, P., Stephenson, H., & Lansford, L. (2016).
Upper Intermediate	Stephenson, H., Lansford, L., & Dummett, P. (2016).

New English File, Oxford University Press (Oxford):

Elementary	Oxenden, C., Latham-Koenig, C., & Seligson, P. (2004).
Pre-intermediate	*as above*
Intermediate	Oxenden, C., & Latham-Koenig, C. (2006).
Upper Intermediate	*as above*

Total English, Pearson Education (Harlow):

Elementary	Foley, M., & Hall, D. (2005).
Pre-intermediate	Acklam, R., & Crace, A. (2005).
Upper Intermediate	*as above*
Intermediate	Clare, A., & Wilson, J.J. (2006).