

L2 English Articles and the Computation of Uniqueness

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1. Introduction

There has been much recent work investigating second language (L2) acquisition of English articles by speakers of article-less L1s (Huebner 1983, Master 1987, Parrish 1987, Thomas 1989, Kaneko 1996, Leung 2001, Ionin, Ko and Wexler 2004, Hawkins et al. 2006, Ko, Ionin and Wexler 2006, Ionin, Zubizarreta and Bautista Maldonado 2008, Trenkic 2008, among others). Examining L2-learners' production of English articles, this research has largely focused on the reasons behind L2-learners' article misuse. In particular, the work of Ionin et al. (2004) and Ko et al. (2006) has shown that article misuse in L2-English is not random but rather is constrained by the semantic features of *definiteness*, *specificity*, and *partitivity*.

In the present paper, we take a different approach: first, we investigate comprehension instead of production; second, we ask how L2-English learners whose L1s lack articles acquire the very concept of *definiteness*. Specifically, we investigate whether Mandarin Chinese-speaking L2-English learners are sensitive to the semantic concept of uniqueness that underlies definiteness. We also identify pragmatic factors that contribute to the computation of uniqueness in L2-English. Based on our experimental data, we argue that L2-English learners are sensitive to the importance of uniqueness in determining definiteness, but also over-rely on the discourse factors of previous-mention and association in determining whether *the* or *a* should be used.

2. Background

In this section, we briefly discuss the semantics and pragmatics of definiteness, and review previous studies of articles in L2-acquisition.

2.1. Semantics of definiteness

Definiteness is a discourse-related semantic feature: it is related to the knowledge state of the speaker and hearer in the discourse. As shown by the informal definition in (1), based on Ionin et al. (2004), the feature [+definite] reflects the knowledge state of both speaker and hearer (see Heim 1991 on the formal semantics of definiteness).

- (1) If a Determiner Phrase (DP) of the form [D NP] is marked as [+definite], this indicates that the speaker assumes that the hearer shares the speaker's presupposition of the existence of a unique individual in the set denoted by the NP.

In English, the feature [+definite] is morphologically encoded by the definite article *the*, as illustrated by (2). Upon the first mention of a pen, the speaker does not have grounds for assuming that

the hearer shares knowledge of a unique, contextually salient pen; therefore, use of *the* is infelicitous, and *a* has to be used instead. Upon the second mention of the same pen, however, the hearer is already acquainted with a salient pen, the conditions of definiteness have been met, and *the* is used.

- (2) I have *a pen* in my bag. I will give you the pen.

As spelled out in (1), felicitous use of *the* with singular NPs has three components: the existence presupposition must be met (at least one salient pen must exist in the discourse); the uniqueness presupposition must be met (at most one salient pen must exist in the discourse); and these presuppositions must be shared by speaker and hearer (i.e., knowledge of a salient pen on the speaker's part only is not sufficient). While many recent studies, reviewed in the next section, have examined whether L2-English learners are sensitive to the "hearer knowledge" requirement, and, to a lesser extent, learners' knowledge of the existence presupposition, there has been little investigation into how L2-English learners compute the concept of uniqueness. This is the focus of our study.

2.2. Previous studies on articles in L2-English

Many researchers (Huebner 1983, Master 1987, Thomas 1989, Ionin et al. 2004, among many others) have found that L2-English learners often overuse *the* with indefinites and/or overuse *a* with definites. A number of proposals have been made to account for these patterns of article misuse, with the focus on the role of speaker vs. hearer knowledge.

Previous studies within the framework of Bickerton (1981) tried to explain article misuse by investigating whether L2-English learners associate the definite article *the* with [+SR] (specific referent) or with [+HK] (assumed hearer knowledge). The results, however, were somewhat contradictory (see Thomas 1989 for findings that *the* is associated with the [+SR] feature, and for a review of earlier studies). One of the problems for this approach, pointed out by Ionin (2003), is that the feature *specific referent* was never clearly defined. Another problem, from our perspective, is that the focus on *hearer knowledge* ignores the relevance of the uniqueness presupposition to the semantics of *the*.

More recent work, by Ionin (2003) and Ionin et al. (2004, 2008) argued that L2-English learners from article-less L1s associate *the* with the semantic feature of *specificity*, defined as "speaker intent to refer", with the informal definition in (3) (see Ionin 2003, Ionin et al. 2004 for the formal definition).

- (3) If a Determiner Phrase (DP) of the form [D NP] is [+specific], then the speaker intends to refer to a unique individual in the set denoted by the NP, and considers this individual to possess some noteworthy property.

Based on the observation that some languages, notably Samoan, morphologically encode specificity instead of definiteness, Ionin et al. (2004) proposed that L2-English learners coming from article-less L1s should have access to the semantic universals of both *definiteness* and *specificity*, through Universal Grammar. According to Ionin et al.'s *Fluctuation Hypothesis*, L2-learners are predicted to fluctuate between using English articles to mark definiteness and using them to mark specificity, with the result that errors were predicted to occur only in the contexts of specific indefinites (overuse of *the*) and non-specific definites (overuse of *a*).¹ These predictions were largely confirmed with adult L1-Russian and L1-Korean L2-English learners, who were found to often

¹ See Ionin, Zubizarreta and Philippov (2009) for modifications to the original Fluctuation Hypothesis. Based on new evidence from Samoan (Fuli 2007), Ionin et al. (2009) argue that only specificity-related errors with indefinites, not specificity-related errors with definites, reflect L2-learners' access to the semantic universal of specificity; their revised proposal receives support from findings with L1-Russian L2-English children. This revision has no direct bearing on the present paper, however.

associate *the* with *specificity as speaker knowledge*, rather than always associating it with *definiteness (hearer knowledge)*.

A separate issue is whether L2-English learners can correctly associate *the* with the presupposition of uniqueness. This was the question investigated by Ko et al. (2006), who examined article use in L2-English in the context of *partitivity*, whose definition is given in (4) (cf. Enç 1991 for a theoretical account of partitivity).

- (4) If a DP of the form [D NP] is [+partitive], it denotes an individual that is a member of a set introduced by previous discourse.

An example of a [+partitive] context is given in (5). The mention of three pens in the first sentence establishes the existence presupposition, but not the uniqueness presupposition: a set of pens is presupposed to exist, but it contains more than one element. Therefore, use of *the* with a singular NP in the second sentence is infelicitous, and *a pen* (or an overt partitive, *one of the pens*) should be used instead. However, Ko et al. (2006) found that L1-Korean L2-English learners frequently overused *the* in contexts such as (5) (this finding was later replicated with L1-Serbo-Croatian learners of English, by Ko, Perovic, Ionin and Wexler 2008; see also Kaneko 1996 for similar findings with L1-Japanese L2-English learners).

- (5) I have three *pens* in my bag. I will give you a pen / #the pen.

Ko et al. (2006) proposed that L2-English learners from article-less L1s fluctuate between the semantic universals of definiteness, specificity, and partitivity, so that errors of *the* overuse can be tied either to specificity (speaker knowledge without hearer knowledge) or partitivity (existence without uniqueness). Similar findings of *the* associated with partitivity have been attested in L1-acquisition. The studies of Maratsos (1976) as well as Schafer and de Villiers (2000) found that young English-acquiring children overused *the* when a set of referents was established in the discourse. While the original account of Maratsos (1976) attributed this error pattern to young children's egocentricity, Wexler (2003) proposed an alternative semantic explanation, and argued that young children optionally associate *the* with the existence presupposition but not the uniqueness presupposition. The findings of Ko et al. (2006, 2008) show that this association of *the* with existence exists in L2-acquisition as well.

2.3. Ways of establishing uniqueness

All of the studies discussed above focus on L2-English learners' sensitivity to article semantics. A separate, albeit closely related, research question is whether L2-English learners are sensitive to the pragmatic conditions on article use, in particular, to the different pragmatic ways of establishing of uniqueness. As shown by Hawkins (1978, 1991), the central notion of uniqueness can be established in many different ways.

According to Hawkins (1978), definiteness is related to the identifiability of referents in discourse. A definite referent is one that can be uniquely identified in the discourse. Hawkins (1978) identifies a total of eight types of non-generic uses of *the*, some of which are exemplified below.

- (6) Multiple ways of establishing uniqueness
- a. *Anaphorically (through previous mention):*
I bought a blue cup. The blue cup broke.
 - b. *Through association:*
We went to a wedding. The bride was very tall.

- c. *Through entailment (via PPs, adjectives, or modifying clauses):*
The movie that we are going to watch is the most popular one.
The roof of our house is leaking.
- d. *In the visible or immediate situation:*
 Pass me the salt, please.
 Don't go there, the dog will bite you.
- e. *Through world knowledge:*
The sun is shining.

We can see from (6) that while the uniqueness of the referent in (6a-c) is established through the discourse context, the uniqueness of the referent is established exclusively through knowledge of the world and/or the situation in (6d-e). The focus of our study is on uniqueness established through the discourse context, so we will restrict our attention to the three subtypes of definites in (6a-c).

We furthermore examine whether L2-learners are able to distinguish the effects of previous mention and association from the effects of uniqueness, i.e., whether they know that *a* rather than *the* should be used in the contexts in (7). The contexts in (7) establish the presupposition of existence (the relevant set of students or wedding guests is presupposed to exist), but not the presupposition of uniqueness (since there are three students and multiple guests). Thus, those contexts correspond to the *partitive* indefinite contexts tested by Ko et al. (2006, 2008); examining them in our study allows us to investigate the effects of partitivity (set membership without uniqueness) in comprehension.

- (7) a. *Previous mention without uniqueness:*
 Carl had dinner with three students and two professors yesterday. A/#the student brought the wine they drank.
- b. *Association without uniqueness:*
 I went to a wedding yesterday. A/#the guest gave a speech.

3. Research questions and hypotheses

Following the proposals of Ionin et al. (2004) and Ko et al. (2006), we hypothesize that L2-English learners are able to access the semantic universal of *definiteness*, as stated in (8).

- (8) **Hypothesis 1**
 Since L2-English learners have access to the semantic universal of *definiteness*, with the semantics of *uniqueness*, they should prefer *the* to *a* when uniqueness is established in the discourse context, as in (6a-c).

We further hypothesize that L2-English learners may have difficulty computing uniqueness across a variety of discourse contexts: while they should be sensitive to the central concept of uniqueness, their ability to compute uniqueness may depend on the discourse context. This leads to the hypothesis in (9).

- (9) **Hypothesis 2**
 L2-English learners will not be equally successful at computing the uniqueness of the referent in the context types in (6a-c), and will therefore show variation in their responses to these contexts, in contrast to native English speakers.

Finally, we consider the findings of Ko et al. (2006, 2008) that in production, L2-English learners from article-less L1s overuse *the* with partitive indefinites, in contexts similar to those in (7); we therefore expect to see the same phenomenon in comprehension – i.e., for learners to associate *the* with

previous mention and association even when the uniqueness presupposition has not been met. This leads to our third hypothesis, in (10).

(10) **Hypothesis 3**

L2-English learners will allow *the* in contexts involving previous mention and association even when the uniqueness presupposition has not been established.

4. Methods

4.1. Participants

The participants in this study were 65 L1-Mandarin Chinese L2-English speakers and 27 adult L1-English controls. Mandarin Chinese is an article-less language, and speakers of this language have been shown to exhibit the effects of specificity in the production of English articles (Trenkic 2008)²; this population has not been previously tested for effects of partitivity.

All of the L2-English learners were students at the University of Shanghai, aged between 18 to 23 (mean age 19.3). At the time of testing, all of the learners had studied English for at least 6 years, and had achieved a score of between 111 and 130 on the National Matriculation English Test (NMET) in China, which has the maximum possible score of 150. Their average self-rated proficiency score in English was 3.2 on a scale from 1 (beginner) to 5 (advanced). Based on the NMET scores and the self-ratings, these learners were classified as having intermediate L2-proficiency.³ They had been exposed to English articles in their schooling, but were not expected to be fully target-like. None of the learners had ever lived in an English speaking country.

The adult L1-English controls were all students at the University of Illinois at Urbana-Champaign, and were aged 18 to 23 (mean age 20.1).

4.2. Task

The test instrument was an Acceptability Judgment Task (AJT). The participants were instructed to read pairs of sentences and judge whether the second sentence was acceptable as a continuation of the first sentence, using a scale from 1 (unacceptable) to 4 (acceptable).

Altogether there were 88 sentence pairs, belonging to 11 different categories of 8 items each: 4 items containing *the* and 4 otherwise identical items containing *a*. Of the 11 categories, 5 categories (40 items) are of relevance to the present study (see Yang and Ionin, in preparation, for results of some other categories, which investigated effects of specificity). The relevant categories are illustrated in (11) through (15), with two examples for each type, one with *the* and the other with *a*.⁴ Half of the items in each category had the target DP in subject position, and half in object position. While the stimuli are presented in pairs here, for ease of reference, they were presented individually in the actual test (e.g., (11a) and (11b) were presented at different points in the test).

²However, Trenkic (2008) gives a different explanation to these findings, arguing for the role of cognitive strategies rather than semantic universals. See Ionin et al. (2009) for more discussion of the competing theories of article semantics.

³The 65 participants were chosen from a larger sample of 93 based on their proficiency scores; the remaining 28 participants were either of low proficiency (NMET score below 111) or advanced proficiency (NMET score above 130), or else failed to report their proficiency. Focusing on the intermediate learners allows us to control for individual variability.

⁴We originally included a sixth category, non-unique possessive definites, as in “Please don't sit in this chair. I accidentally broke the leg of this chair yesterday”, to see whether L2-English learners would allow *the* in this context. However, not only L2-English learners but also native English speakers allowed *the* in this context, apparently treating it as definite. We therefore do not include this category in our analysis. See Barker (2004) for an account of the unusual behavior of these possessive constructions, which Barker calls “weak definites”.

- (11) **Category 1:** uniqueness established through previous mention (target: *the*)
- I saw a cat. I stroked the cat.
 - I saw a cat. I stroked a cat.
- (12) **Category 2:** uniqueness established through association (target: *the*)
- I went to a wedding yesterday. The bride was very beautiful.
 - I went to a wedding yesterday. A bride was very beautiful.
- (13) **Category 3:** uniqueness established through the possession relation, with a genitive *of*-PP (target: *the*)
- I bought a house. The roof of my house is grey.
 - I bought a house. A roof of my house is grey.
- (14) **Category 4:** non-uniqueness with previous mention (target: *a*)
- Dennis has many interesting books. His cousin borrowed the book from him yesterday.
 - Dennis has many interesting books. His cousin borrowed a book from him yesterday.
- (15) **Category 5:** non-uniqueness with association (target: *a*)
- I went to a wedding yesterday. The guest gave a speech.
 - I went to a wedding yesterday. A guest gave a speech.

Under Hypothesis 1 in (8), we predict that L2-English learners will rate sentences with *the* higher than sentences with *a* in Categories 1, 2, and 3 above. In other words, we expect that L2-learners will link *the* to the semantic concept of uniqueness. Under Hypothesis 2 in (9), we predict that learners' responses across these three categories will not be uniform, in contrast to native speakers' responses. Finally, under Hypothesis 3 in (10), we predict that L2-English learners will rate sentences with *the* highly in previous mention and association contexts even when uniqueness is not established, in Categories 4 and 5 above, due to an association of *the* with the presupposition of existence.

4.3. Procedure

The AJT as well as a language background questionnaire were placed online using a university-based online survey system. Participants in both China and the U.S. were provided with the url for the test, and completed the test on their own, on their home or school computers. The AJT was prefaced with three examples, and the task instructions were repeated on each page of the task. The task took about an hour for L2-English learners and half an hour for native English speakers to complete. Both the L2-English learners and the L1-English controls received extra credit for their participation in the study.

5. Results

We now turn to the results. The group mean ratings across categories are summarized in (16); recall that the rating scale was from 1 (unacceptable) to 4 (acceptable). The cells corresponding to the target response for each category are highlighted.

5.1. Computing uniqueness

Let us first take a look at the L2-English learners' and control group's performance in Categories 1, 2, and 3. As (16) shows, L2-English learners rated sentences with *the* significantly higher than sentences with *a* in Categories 1, 2, and 3, which provides evidence in support of Hypothesis 1 (in (8)), according to which L2-learners are able to distinguish between *the* and *a* on the basis of uniqueness. At the same time, (16) shows that L2-learners are not uniform across the three categories, consistent with

Hypothesis 2 (in (9)): the difference between *the* and *a* is greater for previous-mention (Category 1) and association (Category 2) definites than for possessive definites (Category 3). In contrast, native speakers made distinctions of equal magnitude across the three categories. This contrast is represented pictorially in Figure 1, which gives the means as well as standard deviations for each category.

(16) Mean ratings by category (1=unacceptable, 4=acceptable)

Categories	L1-Chinese L2-English learners (N=65)		L1-English speakers (N=27)	
	mean rating of sentences with <i>the</i>	mean rating of sentences with <i>a</i>	mean rating of sentences with <i>the</i>	mean rating of sentences with <i>a</i>
1. unique through previous mention (target: <i>the</i>)	3.223	2.104*	3.574	2.009*
2. unique through association (target: <i>the</i>)	3.400	2.285*	3.694	2.055*
3. unique through possession relation, with 'of' (target: <i>the</i>)	3.392	2.881*	3.528	1.870*
4. non-unique with previous mention (target: <i>a</i>)	2.435*	2.873	1.843*	3.389
5. non-unique with association (target: <i>a</i>)	3.004	3.088	2.194*	3.176

*difference in mean rating of *the* vs. *a* is significant at $p < .05$

We conducted a repeated-measures ANOVA for each group, with article (*a* vs. *the*) and category (1, 2, and 3) as within-subjects variables. In the case of L2-learners, the ANOVA yielded significant effects of both article ($F(1,64)=53$, $p<.001$) and category ($F(2,128)=34$, $p<.001$), as well as a significant interaction between the two ($F(2,128)=23$, $p<.001$). In contrast, the ANOVA on native speaker results yielded significant effects of both article ($F(1,26)=123$, $p<.001$) and category ($F(2,52)=3.4$, $p<.05$), but no interaction between the two ($F(2,52)=.31$, $p=.74$). While both groups treated the three categories differently (as seen in Figure 1, some categories tended to receive higher ratings than others, perhaps because of the felicity of individual sentences), native speakers made an equal-magnitude distinction between *the* and *a* across the three categories. In contrast, L2-learners made a much stronger distinction in previous-mention and association contexts than with possessives.

5.2. Uniqueness vs. existence

Next, we consider the participants' performance on Categories 1 and 2 vs. 4 and 5, in order to see whether L2-learners are able to distinguish the effects of previous mention/association (present in all four categories) from the effect of uniqueness (categories 1 and 2 only). As (16) shows, although L2-learners rated *the* higher than *a* in the presence of uniqueness (Categories 1 and 2), and rated *a* higher in the absence of uniqueness (Categories 4 and 5), they also tended to rate *the* quite highly in Categories 4 and 5: in the case of Category 5 in particular, learners failed to distinguish between *the* and *a*, accepting both equally. For native English speakers, however, there is a strong distinction between *a* and *the* in the absence of uniqueness.

Figure 2 represents this pictorially: Categories 1 and 2 are combined under the heading "unique" while Categories 4 and 5 are combined under the heading "non-unique", and the means and standard deviations are reported. The data on Categories 4 and 5 support our Hypothesis 3 (in (10)) by showing that L2-English learners overaccept *the* when existence has been established, but uniqueness has not.

Figure 1: comparing performance across Categories 1, 2 and 3.

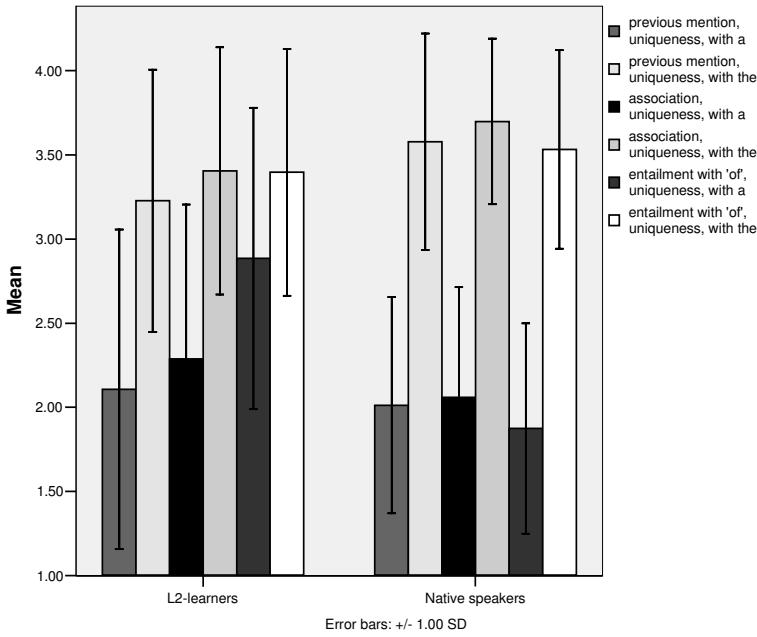
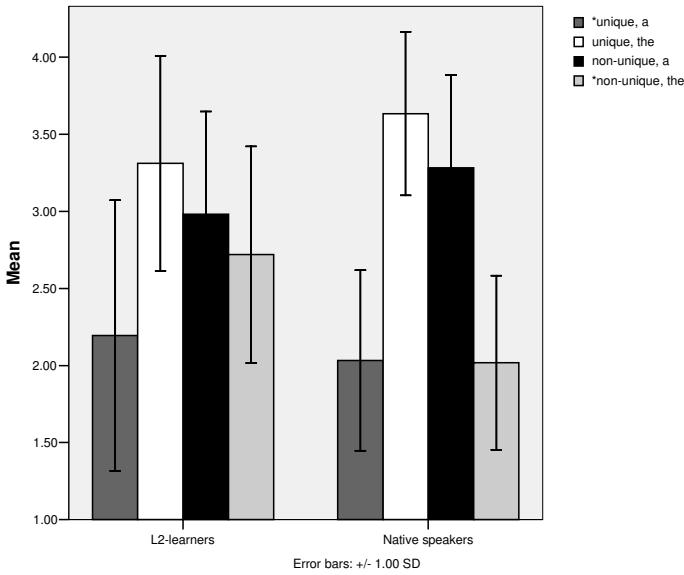


Figure 2: comparing performance across Categories 1 and 2 vs. 4 and 5



6. Discussion

The data reported in the previous section provides support for our hypotheses. We have observed that L2-English learners are able to link *the* with the semantic concept of uniqueness. This suggests that, as we predicted, L2-English learners have access to the semantic universal of definiteness, using uniqueness to distinguish between *the* and *a*. At the same time, we have also observed that although L2-English learners know that the semantic concept of uniqueness is at the core of definiteness, they are not equally sensitive to different ways of establishing uniqueness. They over-rely on the discourse-related factors of previous mention and association in their computation of uniqueness and are not as good at using the possession relation to establish uniqueness. An open question at this point is why this is the case: what makes previous mention and association stronger cues for uniqueness in L2-English than the possession relationship? One possibility is that this is due to the greater syntactic complexity of definite possessives: in order to compute uniqueness in a definite DP such as *the roof of my house*, L2-learners need to understand the syntax of possession and the role of the genitive *of*-PP. In contrast, in computing uniqueness for less syntactically complex DPs, such as *the book* or *the bride*, learners need to consider the discourse situation only. Yet another possibility is that learners encounter previous-mention and association contexts more frequently than possessive DPs in their input and/or their classroom instruction, a possibility that requires further investigation. We leave the question open for the time being.

Finally, we found that L2-learners overaccepted *the* in the context of previous mention or association even when uniqueness is not established. This finding from comprehension is consistent with Ko et al.'s (2006, 2008) findings from production data that L2-English learners overuse *the* when the existence presupposition, but not the uniqueness presupposition, has been satisfied in the discourse. Previous mention and association are both ways of establishing the existence presupposition, through mention of a relevant set either explicitly (previous mention: *three friends* → *a friend*) or implicitly (via association: *the wedding* → *a wedding guest*). Ko et al. similarly found that both explicit and implicit set membership led to overuse of *the* with indefinites.

Our findings offer a possible explanation of why L2-learners sometimes associate *the* with partitivity rather than definiteness: by over-relying on the discourse factors of previous mention and association, learners may conclude that *the* encodes membership in a previously mentioned set (i.e., partitivity) rather than uniqueness. Support for this idea comes from our finding that when set membership is not involved, as in the case of possessive definites (*the roof of my house*), L2-learners show greater overuse of *a*. However, this finding contradicts the production findings of Ionin et al. (2004) and Ko et al. (2006) that L2-learners produced *the* correctly with definites such as *the owner of this store*, where no set membership is involved (no owners are previously mentioned, explicitly or implicitly). It is not clear whether this difference between the studies is due to methodology (production vs. comprehension), the learners' native language, or the type of construction (note that in *the roof of my house*, the roof belongs to the house, whereas in *the owner of this store*, the store belongs to the owner, not the owner to the store). Thus, more work remains to be done.

7. Conclusion

In this paper, we have examined L2-English learners' sensitivity to the semantics of uniqueness as well as to the different ways of establishing uniqueness in the discourse. Our findings contribute to the investigation of L2-English articles in two ways: first, by presenting comprehension data in a domain that is typically studied only with respect to production; and second, by showing that L2-learners' sensitivity to the semantics of definiteness is closely tied to the pragmatic context.

A number of open questions remain for further research. First, why do L2-learners over-rely on previous mention and association in their computation of uniqueness, and have more difficulty with possessive definites? Second, why do L2-learners overaccept *the* when the existence presupposition has been satisfied but the uniqueness presupposition has not, and is this directly related to their over-reliance on previous mention and association? Third, will there be any differences in learners' production vs. comprehension of English articles, if both are tested with the same population of learners? And finally, how do L2-learners overcome their over-reliance on discourse-related factors

and achieve target-like use and comprehension of English articles? More research is needed with L2-English learners from different L1s, using a variety of methodologies as well as a variety of definite constructions.

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