



## ATOMICITY AND COUNTABILITY IN LINGUISTICALLY-INFORMED INSTRUCTION: ACQUISITION OF L2 ENGLISH NOUN TYPES

Dakota J. THOMAS-WILHELM<sup>1</sup>

*University of Illinois System*

Elisabet PLADEVALL-BALLESTER<sup>2</sup>

*Universitat Autònoma de Barcelona*

### *Abstract*

While the literature shows that there is strong support for the effects of explicit instruction on explicit language knowledge, there has been little research on the effects of different types of explicit instruction on language acquisition. This study attempts to bridge the gap between Instructed Second Language Acquisition and Generative Second Language Acquisition by creating an instructional context that employs Generative theories and findings in order to teach L2-English articles and noun types. The study investigates L1-Mandarin learners in three different instructional contexts (linguistically-informed instruction, traditional instruction, and no extra instruction) acquiring countable and uncountable nouns in an indefinite-singular article context in L2 English. As measured by an elicited-sentence imitation task and an acceptability judgment task at pre-test, immediate posttest, and three-week-delayed post-test, the results find that learners receiving explicit instruction on the semantic features needing to be reassembled make the greatest gains over the duration of the study. These findings suggest that if linguistically-informed instruction were implemented in a systematic way throughout an entire grammar course, it may lead to greater linguistic gains in a shorter amount of time.

**Keywords:** atomicity; countability; Generative Second Language Acquisition; Instructed; Second Language Acquisition; Linguistically-Informed Instruction; Language Pedagogy

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1. dakotat@uillinois.edu.  <https://orcid.org/0000-0002-4845-0161>  
2. elisabet.pladevall@uab.cat.  <https://orcid.org/0000-0002-2793-9179>

## ATOMICIDAD Y CONTABILIDAD EN LA ENSEÑANZA LINGÜÍSTICAMENTE INFORMADA: ADQUISICIÓN DE LOS TIPOS DE NOMBRES EN INGLÉS COMO L2

### *Resumen*

Si bien la bibliografía muestra evidencias de los efectos de la instrucción explícita en el conocimiento explícito de la lengua, ha habido poca investigación sobre los efectos de los diferentes tipos de instrucción explícita sobre la adquisición de segundas lenguas. Este estudio pretende acercar dos enfoques (la adquisición de segundas lenguas en contextos de instrucción y la adquisición de segundas lenguas desde una perspectiva generativista) mediante la creación de un contexto de instrucción que emplea la teoría generativista para la enseñanza del uso de los artículos con los diferentes tipos de nombres en inglés L2. El estudio analiza tres contextos diferentes (instrucción lingüísticamente informada, instrucción tradicional y no instrucción) en la adquisición de sustantivos contables y no contables precedidos del artículo indefinido singular en inglés L2 por parte de hablantes de chino mandarín. Mediante una tarea de imitación de oraciones y una tarea de juicios de aceptabilidad desarrolladas en tres momentos (antes de la intervención pedagógica, inmediatamente después y al cabo de tres semanas), los resultados muestran que los estudiantes que recibieron instrucción explícita sobre las características semánticas que necesitan ser reestructuradas en la adquisición de los tipos de sustantivos mejoran de manera más significativa. Estos hallazgos sugieren que la instrucción lingüísticamente informada implementada de manera sistemática a lo largo de todo un curso de gramática podría conducir a un mayor aprendizaje en un período de tiempo más corto.

*Palabras clave:* atomicidad; contabilidad; adquisición generativa de segundas lenguas; adquisición de segundas lenguas en contextos de instrucción; instrucción lingüísticamente informada; pedagogía lingüística

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### 1. INTRODUCTION

The general consensus within second language (L2) grammar instruction is that explicit instruction is more effective than implicit instruction (Norris & Ortega, 2000; Spada & Tomita, 2010). What remains less clear is what type of knowledge is developed from explicit instruction (Norris & Ortega, 2000) and why certain linguistic forms are more difficult to acquire than others (Slabakova, 2009b, 2013). Furthermore, functional morphology which often lacks saliency and can be syntactically and semantically complex (e.g., English noun types) can prove difficult for

L<sub>2</sub> learners (Slabakova, 2013). Within L<sub>2</sub> acquisition research, there exists a gap between Generative Second Language Acquisition (GenSLA) theoretical findings and Instructed Second Language Acquisition (ISLA) pedagogy. To date, only a handful of studies have been conducted and informed by GenSLA research (Lopez, 2017; Lopez & Sabir, 2017; Sabir, 2018; Umeda, Snape, Yusa, & Wiltshier, 2017), and there still exists a need to link theoretical GenSLA research and ISLA pedagogy (Marsden & Slabakova, 2019; Whong, Gil, & Marsden, 2013). The current study was born out of this need for further research that encourages links between GenSLA and ISLA paradigms. In our study, linguistically-informed instruction refers to a method of instruction that directly applies GenSLA theoretical findings in an ISLA pedagogical environment. The study reports on the development of this instructional context based on GenSLA theories of Feature Reassembly (Lardiere, 2008, 2009a, 2009b), the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b, 2019), and the Cline of Difficulty (Cho, 2012; Slabakova, 2009a, 2013).

In our study, we create an instructional intervention for L<sub>1</sub>-Mandarin, L<sub>2</sub>-English learners in a classroom setting, which specifically teaches the semantic features of English noun types. Previous research (Cho & Slabakova, 2014; Choi & Ionin, 2017; Choi, Ionin, & Zhu, 2018; Choi, Zhu, & Ionin, 2019; Hua & Lee, 2005; Slabakova, 2013) has found that the underlying semantic feature settings of noun types, that is [ $\pm$ count] and [ $\pm$ atomic], prove to be particularly problematic in the acquisition of English noun types for learners from generalized classifier languages. The specific aim of this study is to investigate the effects of different types of instruction on the non-native English acquisition of noun type distinctions in different article contexts by Mandarin-speaking students.

The article starts with a brief overview of atomicity and countability research in noun type acquisition and instruction, and an examination of recent GenSLA theories on the reassembly of L<sub>1</sub> features for the L<sub>2</sub> and the acquisition of functional morphology. We then present the details of the study, our results, and the primary findings. This paper concludes with considerations of limitations and implications for both further research and future language pedagogy.

## 2. LITERATURE REVIEW

When the English noun type distinctions are examined, their complexity is highlighted and demonstrates why errors are widely reported, even amongst advanced L<sub>2</sub> learners. Within the theoretical literature, there is wide agreement surrounding atomicity and countability in terms of what these features mean and

how they are represented in languages that do not have a countable/uncountable distinction with their nouns. The definition of countability adopted in the current study comes from Gillon (1992), which places the denotations of both countable and uncountable nouns in the same domain with the features [+count] and [-count]. While the [±count] feature can easily separate countable nouns from uncountable nouns, it is not sufficient to distinguish between the two different uncountable noun types in English. In order to differentiate between substance- and object-uncountable nouns, which are both [-count], in English, we also need to consider atomicity. The definition of atomicity adopted in the current study is from Choi and Ionin (2017, p. 1): «A noun is atomic iff it cannot be divided into smaller parts which still bear the property denoted by the NP.» In other words, a noun is [+atomic] if you can divide it into smaller units which would still denote the same properties as the original noun. In English, these semantic features [±atomic] and [±count] are combined to make three different noun types, as in (1)–(3).

- (1) [+count, +atomic] Countable Nouns: *dog, cat*
- (2) [-count, +atomic] Uncountable-Object Nouns: *furniture, money,*
- (3) [-count, -atomic] Uncountable-Substance Nouns: *wine, cheese*

### 2.1. *Noun Type Acquisition*

English noun type distinctions are notoriously difficult to acquire by L<sub>2</sub> learners whose L<sub>1</sub>s are Generalized Classifier Languages (GCLs). Previous research (Choi & Ionin, 2017; Choi *et al.*, 2018; Choi *et al.*, 2019) shows that GCLs, such as Mandarin, do not have a fully grammaticalized distinction between countable and uncountable nouns. According to Cheng & Sybesma (1998, 1999, 2014) the link between atomicity and morphosyntax of nouns in GCLs is more direct than the countability distinction. While noun types in their bare form (i.e., without a classifier) provide a distinction between [+atomic] and [-atomic], the classifier system is grammaticalized for a distinction between [+count] and [-count] features. In addition, while countability is encoded directly on the morphosyntax of the Mandarin classifier system, plural marking in Mandarin is restricted to [+human] nouns and can also be morphologically realized in the demonstrative determiners modifying nouns (Cheng & Sybesma, 1998, 1999, 2014). See examples (4)–(6) below from Choi *et al.* (2018, p. 154).

- (4) *shu*(\*-men)  
book(-PL)  
«book(s)»
- (5) *jiaju*(\*-men)  
furniture(-PL)  
«furniture»
- (6) *shui*(\*-men)  
water(-PL)  
«water»

Only a handful of studies have investigated the acquisition of English noun types (Choi & Ionin, 2017; Choi *et al.*, 2018; Choi *et al.*, 2019; Hua & Lee, 2005; Inagaki, 2013). Hua and Lee (2005) conducted a study with L1-Mandarin, L2-English participants investigating their sensitivity to [±count] feature settings with articles and quantifiers in count-selective and mass-selective contexts. Using a grammaticality judgment task (GJT) and forced-choice elicitation task (FCET), they found that L1-Mandarin, L2-English learners demonstrated sensitivity to different nouns presented in count-selective and mass-selective contexts but did not make the same distinctions solely on a word-by-word basis. A study by Inagaki (2013) investigated quantity judgments by L1-Japanese, L2-English speakers of countable and uncountable nouns using a picture-matching task (PMT) based on Barner and Snedeker (2005). Inagaki (2013) found that L2-English learners performed similarly to NSs in basing their quantity judgments on number for [+count] nouns and volume for [−count] nouns. Furthermore, they found that the interpretation of flexible nouns was not altered by changes in syntax.

In a series of studies conducted by Choi and colleagues (Choi & Ionin, 2017; Choi *et al.*, 2018; Choi *et al.*, 2019), they investigated both countability and atomicity in L1-Korean and L1-Mandarin, L2-English speakers. Using a self-paced reading task (SPRT) and a GJT, Choi and Ionin (2017) found that L2-English learners displayed sensitivity to plural marking on [−count, −atomic] nouns but not [−count, +atomic] nouns as measured by the GJT and SPRT. This led them to conclude that L2-English learners from GCLs struggle with the incompatibility between plural marking and atomicity in English. With a cloze task, Choi *et al.* (2018) found that L2-English learners correctly used *-s* with [+count] and optionally overuse it with [−count, +atomic] nouns but do not use it with [−count, −atomic] nouns. Finally, Choi *et al.* (2019) used a PMT to investigate [±count] and object-/kind-reference. In their results, they found that L1-Korean and L1-Mandarin learners

of English allow plural marking on [–count, +atomic] nouns to denote objects to a greater extent than English native speakers.

## 2.2. *Generative Second Language Acquisition*

In this study, the acquisition of noun-types will be approached through the Feature Reassembly Hypothesis (Lardiere, 2008, p. 4), which states that, «the ways in which grammatical features are morphologically combined and conditioned may well affect their acquirability and overt realization in SLA.» One of the primary assumptions of this proposal is that learners look for morphological correspondences between their L1 and L2. Under her hypothesis, the assembly of features in the L2 causes greater difficulty when they differ from the assemble in the L1. Thus, depending on how features are assembled (either overt or covert realization is possible) and conditioned, some features may be just as difficult to acquire as others.

Following on the proposal for the Feature Reassembly Hypothesis (Lardiere, 2008, 2009a, 2009b), Slabakova (2008, 2009a, 2009b) makes predictions for learnability based on what is ‘easy’ and what is ‘hard’ to acquire. She predicts that learning situations where re-assembly of grammatical features is required are more challenging than situations in which simple remapping of L1 to L2 morphemes are required. She calls this the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b) and the Cline of Difficulty (Slabakova, 2009a). According to the Bottleneck Hypothesis, language learnability lies within language variation. Slabakova (2016) goes on to say that the motivation for her proposal is practical: areas of grammar that are more difficult should get more instructional effort and attention. The ‘Bottleneck’ of language learning, therefore, lies in functional morphology.

Within the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b), the Cline of Difficulty (Cho & Slabakova, 2014; Slabakova, 2009a) makes specific predictions on the degrees of difficulty in feature mapping, where different language backgrounds and target languages pose different levels of difficulty in their learning situations. According to the Cline of Difficulty (Cho & Slabakova, 2014; Slabakova, 2009a), morpheme to morpheme mapping with no reassembly is the easiest to acquire, while morpheme to morpheme with reassemble is expected to be more difficult. In Mandarin, the countability and atomic features are morphologically realized, but they are assembled differently than English. Therefore, L1-Mandarin/L2-English learners must map their L1 features to English and then reassemble them strictly onto nouns.

The Feature Re-Assembly Hypothesis by Lardiere (2008, 2009a, 2009b) assumes that the learners will assess their interlanguage grammars and rebuild the features to become more native-like. While it may be possible to create a steady-state grammar that is similar to a NS, their ability to produce structures that are similar to those of the NS may take longer to develop. Additionally, the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b) predicts that functional morphology is especially difficult for L2 learners and that this will considerably slow down their acquisition process. Therefore, it is predicted that learning the functional morphology of English noun types will be particularly difficult for these L2 learners, as the L2 grammar is much different from the L1 grammar. This highlights the importance of what requires more focus in language instruction.

Having established the GenSLA theoretical background, we now turn our attention to ISLA and the previous research on linguistically-informed instruction before describing the study and presenting our results.

### *2.3. Instructed Second Language Acquisition*

In the SLA literature, ISLA research regularly tackles questions such as *Which type of instruction is of most use?* and *Which language features most benefit from classroom input?* It is generally agreed upon in the literature that L2 grammar instruction can be effective (Norris & Ortega, 2000; Spada & Tomita, 2010) although some structures, such as English articles and noun types, are notoriously problematic. In the literature, many studies have investigated the overall effects of implicit or explicit grammar instruction. Implicit instruction generally involves exposing the learners to a target structure without any attention to rules or negative feedback, whereas explicit instruction focuses on the rules. Norris and Ortega (2000) and Spada and Tomita (2010) found there is widespread support for providing some form of explicit instruction during language lessons for both simple and complex grammar forms, although they were unable to conclude whether instruction can improve implicit knowledge or just explicit. According to Ellis (2009), there are a number of differences between implicit and explicit knowledge, including awareness, access, and use of the linguistic knowledge. Furthermore, Loewen (2015) states that recent research in ISLA has been informing the question of «whether explicit instruction leads to the acquisition of explicit knowledge in L2 learners» (p. 31). While it is generally assumed that explicit knowledge is a result of explicit instruction (Doughty, 2003), the effect of different types of explicit instruction on explicit knowledge is still unknown. While there continue to be disagreements in

the literature as to whether explicit knowledge can become implicit knowledge, it has yet to be determined if explicit instruction that targets explicit knowledge may or may not have long-term effects on implicit knowledge of forms.

Previous research on the effects of instruction have only looked at traditional implicit and explicit instruction. Bruhn de Garavito (2013) further examined the effect of formal instruction and argues that the methodological decisions surrounding grammar instruction often depend on the theoretical position about the role of input. She relates L2 Spanish object pronoun instruction with GenSLA empirical research finding about the acquisition of object pronouns. She investigates how they are currently taught in language textbooks and how input that learners receive might be improved. Bruhn de Garavito identifies differences between English and Spanish object pronouns that cause confusion to L2 Spanish learners. She considers these differences in how they relate to the findings in GenSLA research on clitic position, and further suggests how these findings might be applied to language teaching. The author concludes that the most important takeaway message should be that «research carried out within the generative tradition has something to say regarding language teaching» (p. 32). She identifies this as a two-way street, though. While GenSLA empirical findings can inform language pedagogy, language pedagogy should also inform the research that is conducted within GenSLA, and that all the work in both fields needs to be more comprehensible to those in the other field.

In this study, the type of explicit instruction used, linguistically-informed instruction, is relatively new and there are no instructional intervention studies, to date, that have investigated the effects of instruction with regard to L2-English noun types. The majority of previous research on English noun types has investigated quantity judgments of countable and uncountable nouns with children and L2 learners. With mixed results on the effects of linguistically-informed instruction on the acquisition of L2-English features in the literature review, and no studies to date on the effects of linguistically-informed instruction of noun types, the present study adds to this limited field by looking at the development and reassembly of English noun type semantic features in an indefinite-singular context. We now turn our attention to the study, which will explain the participants, the methods of data collection, and the data analysis.

### 3. THE STUDY

The aim of this study is to test previous proposals (Lopez, 2017; Sabir, 2018; Snape & Yusa, 2013) that make recommendations for innovating teaching material (Marsden & Slabakova, 2019) by investigating the acquisition of L2-English noun types in an indefinite-singular context (e.g., *a dog*, *\*a furniture*, *\*a toothpaste*). Using a pre-/post-test design, this study investigates the effect of instruction on L1-Mandarin speakers in three different instructional contexts—linguistically-informed instruction (LING), traditional instruction (TRAD), and no extra instruction (NOEX). We attempt to do this and explore the overarching question of whether or not it is beneficial for L2 acquisition to create a teaching and learning environment that is informed by both GenSLA research and instructed second language acquisition (ISLA) pedagogy. Informed by the Feature Reassembly Hypothesis (Lardiere, 2008, 2009a, 2009b), the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b), and the Cline of Difficulty (Slabakova, 2009a), this new instructional pedagogy teaches L2-English noun types through semantic universals: [ $\pm$ atomic] and [ $\pm$ count]. We investigate the effects of instruction through two primary research questions:

1. What is the effect of each type of instruction on the reassembly of L1 noun type features for the L2?
2. What type of instruction will lead to greater gains in the reassembly of L1 noun type features for the L2 at both immediate and delayed post-test?

In the literature, there is positive evidence in support of the effects of explicit instruction (Bowles, 2011; Bruhn de Garavito, 2013; Loewen, 2015; Long, 1983, 2009; Lopez, 2017; Lopez & Sabir, 2017; Master, 1994, 2002; Norris & Ortega, 2000; Snape & Yusa, 2013; Sonbul & Schmitt, 2013; Spada & Tomita, 2010); therefore, it is predicted overall that explicit instruction will facilitate the reassembly of the L1 [count] and [atomic] features for the L2. In other words, following explicit instruction, learners should realize that the indefinite article context is count-noun-selective, therefore only permitting singular countable nouns, that is nouns with the feature settings [+count, +atomic]. Following the Cline of Difficulty (Slabakova, 2009a) and the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b), it is predicted that the reassembly of the [count] and [atomic] features will pose moderate difficulty because of the differences in their morphological realizations in the L2 and L2. It is predicted that instruction will mediate this reassembly process. Furthermore, it is predicted that linguistically-informed instruction (Lopez, 2017;

Lopez & Sabir, 2017; Sabir, 2018), by the development of metalinguistic knowledge via teaching abstract linguistic structures, will foster an environment for more successful reassembly of the [count] and [atomic] features than traditional and no-extra-instruction learners.

### 3.1. Participants

The participants consisted of 65 L1-Mandarin, L2-English learners who, at the time of data collection, were enrolled in a 16-week credit-based ESL course at a university in the Midwestern United States. While all of them were enrolled in a grammar course, many of the students were also enrolled in one or more of the other skill courses (reading, writing, listening, or speaking). It is important to note here that the grammar structures covered in this study are not explicitly instructed in these classes, but rather assigned as «self-study» units to the student with no assessments or knowledge checks given over the content/structures. These L2 learners were divided into three participant groups based on the type of instructional intervention they received. Prior to participation in the study, all participants completed a bio-data and language use questionnaire (BLUQ) and the Oxford Quick Placement Test (OQPT) (U. C. L. E. Syndicate, 2001). Table 1 below shows the descriptive statistics of the participants.

	LINGUISTICALLY-INFORMED INSTRUCTION	TRADITIONAL INSTRUCTION	NO EXTRA INSTRUCTION
NUMBER	30 (11 male, 19 female)	18 (9 male, 9 female)	17 (5 male, 12 female)
AGE	17-30 (M = 20.38)	17-22 (M = 19.39)	18-25 (M = 19.47)
OQPT SCORE	20-48 (M = 35.9)	19-52 (M = 33.94)	13-45 (M = 31.94)

Table 1. Participant descriptive statistics

As can be seen in Table 1, there was an imbalance of the number of participants in each group. While some might view this as problematic, the majority of analysis is conducted within group, and any between group analysis in the results is conducted as a gain score analysis, which significantly decreases any effect of number of participants between groups.

The LING group received one-hour of instructional intervention that was informed by GenSLA theory and used the semantic features of the noun types in teaching the differences in feature settings for English articles and noun types, as well as crosslinguistic differences between Mandarin and English. The TRAD group received one-hour of instructional intervention on English articles and noun

types using their assigned grammar textbook, *Grammar & Beyond 4* (Bunting, Diniz, & Reppen, 2009). The third group, NOEX, did not receive any instructional intervention as part of the research study. It must be acknowledged that the decision to only include one-hour of intervention was to maintain an instructional environment which is similar to that of an actual classroom. In the grammar courses from which the participants were recruited, any curricular item is only even given approximately one to two hours of explicit instruction and practice in the classroom. All instructional intervention took place in the hour immediately preceding the immediate post-test data collection session.

### 3.1. Instruments and Data Collection

This study used a pre-test–intervention–post-test design, with a delayed post-test; see Table 2 below. The same tasks were completed at all three data collection times. The pre-test (T<sub>0</sub>) was conducted one week before the instructional intervention, and the immediate post-test (T<sub>1</sub>) was conducted immediately following the instructional intervention. As aforementioned, the delayed post-test (T<sub>2</sub>) was conducted three weeks following T<sub>1</sub>. Two tasks were used at each point: an elicited-sentence imitation task and an acceptability judgment task.

WEEK	LING GROUP	TRAD GROUP	NOEX GROUP
0	Pre-participation questionnaires (BLUQ & OQPT)		
1	To data collection (ESIT & AJT)		
2	1-hour instruction using linguistically-informed materials + T <sub>1</sub> data collection (ESIT & AJT)	1-hour instruction using textbook + T <sub>1</sub> data collection (ESIT & AJT)	No extra instruction + T <sub>1</sub> data collection (ESIT & AJT)
3			
4			
5	T <sub>2</sub> data collection (ESIT & AJT)		

Table 2. Data collection procedure for all groups

The elicited-sentence imitation task (ESIT) and acceptability judgment task (AJT) each consisted of 36 items: 3 nouns for each noun type (countable, uncountable-object, and uncountable-substance) with each noun type in the countable-noun-selective indefinite context *a* \_\_\_. The tasks also included 24 items that tested the same noun types in definite-singular and definite-plural contexts, but those results are not reported here. All data collection was done in an on-campus computer lab, and both tasks were administered in an online form using IBEX Farm (<https://spellout.net/ibexfarm/>). Although ESITs have been greatly debated they have been

proven to be a valid task in collecting data on a speaker's implicit knowledge (Ellis *et al.*, 2009; Spada, Shiu, & Tomita, 2015). As Ellis (2005b, p. 45) states, participants' «failure to imitate a sentence at all or to reproduce it in such a form that they did not create an obligatory context for the target structure of a sentence [is] coded as 'avoidance'». If a participant appropriately imitates a sentence where the target structure is correctly supplied, then it is accepted that the form or structure has become part of the learner's implicit knowledge.

In the ESIT, participants heard a sentence and were asked to repeat the sentence using correct English following a 300ms delay. Each sentence was opinion-oriented. During the 300ms delay, the participants were asked to mark whether they agreed or disagreed with the content of the sentence. This was included to encourage the participants to focus on the meaning of each statement and prevent rote repetition. Example items can be seen in examples (7)–(9) below.

- (7) [+count, +atomic] Countable Nouns  
Everyone likes a boy as their first child.
- (8) [–count, +atomic] Uncountable-Object Nouns  
\*Americans do not have a furniture in their house.
- (9) [–count, –atomic] Uncountable-Substance Nouns  
\*Mexicans add a garlic to their tacos.

Participant imitations were audio recorded and transcribed by the researcher. Following a similar rating scale to Ellis *et al.* (2009), each imitated sentence was scored depending on their ability to correct the sentence. An imitated statement was given a 2 if the statement was grammatically imitated with an appropriate article and noun; a 1 was given if the statement was imitated with either an appropriate article or noun; and a 0 was given if the sentence was not imitated grammatically.

The AJT in this study was untimed and targeted the same article and noun type combinations as the ESIT for a total of 36 items (different sentences than those included in the ESIT); see examples (10)–(12). Participants were asked to rate the acceptability of each item on a 7-point Likert scale ranging from *very acceptable* (7) to *not acceptable at all* (1).

- (10) [+count, +atomic] Countable Nouns  
There is a boy sitting on the ground with his hands on his head.
- (11) [–count, +atomic] Uncountable-Object Nouns  
\*We have a furniture in that room

(12) [-count, -atomic] Uncountable-Substance Nouns  
\*Although they think he is crazy, he puts a salt on everything.

### 3.3. Instructional Intervention

The instructional intervention consisted of a single 60-minute lesson for each the LING and TRAD groups. As explained above, the single one-hour intervention was chosen to mirror the amount of time curricular items are given in this particular skill-based program. For both the LING and TRAD learners, a form-focused explicit instruction approach was used to match what is normally done in their regular grammar courses. All instruction took place in a university classroom adjacent to the computer lab used for data collection. The instructional intervention was conducted in the second week of the 5-week study.

The NOEX group did not receive any instructional intervention on English articles or noun types as part of the study. In addition, this unit of the textbook is assigned as self-study, so these participants did not receive explicit instruction on these topics in their regularly-scheduled grammar courses. The TRAD group were explicitly taught about article choice with countable and uncountable nouns using a form-focused approach and their course-assigned textbook, *Grammar & Beyond 4* (Bunting *et al.*, 2009). Grammar structures and explanations presented in this book take a corpus-based approach, meaning that the grammar presentations are based on an analysis of an English corpus and should represent real-world use. During the instructional intervention, the grammar structures and explanations were presented, followed by dedicated time for practice using the exercises in both the textbook and workbook. Examples of the textbook definitions from *Grammar & Beyond 4* (Bunting *et al.*, 2009, p. 105) can be found in (13)–(15).

(13) Use *a/an* with a singular count noun when the noun is not specifically identified or when it is first mentioned and new to the reader.  
(14) Do not use *a/an* with noncount or plural nouns. Use *some* or  $\emptyset$ .  
(15) Use *a/an* when introducing a count noun.

The LING group received instruction on the semantics of English articles and noun types using newly-created teaching materials. Motivated by previous research (Lopez, 2017; Lopez & Sabir, 2017; Sabir, 2018; Snape & Yusa, 2013), definitions of articles and noun types were presented by first defining the individual feature settings and then giving the explicit lexical forms. To facilitate

with feature reassembly and the bottleneck of language learning, learners were taught how these features are combined to make the various grammatical article and noun type combinations in English. Examples of the pedagogical definitions for atomicity and countability can be found in (16). After the presentation of the definitions of the semantic features, examples of their settings and corresponding noun types were presented as in (17).

- (16) Nouns: a word that refers to a person place, thing, or idea
  - a. [ $\pm$ count]: the feature of a noun that determines whether or not it can have a plural form
  - b. [ $\pm$ atomic]: the feature of a noun that determines if it is made up of individuals
- (17) If a noun is...
  - c. [+count, +atomic]:
    - i. In English, there is one type of nouns that is [+count, +atomic]:
      - 1. Countable Nouns: it has separate singular and plural forms, and the plural form takes a morphological *-s*; these nouns can be counted individually (e.g., *dog*, *dogs*)
    - d. [-count,  $\pm$ atomic]:
      - i. In English, there are two types of nouns that are [-count]:
        - 1. Uncountable-Substance Nouns [-atomic]: it refers to a substance that cannot be individuated or counted (e.g., *toothpaste*)
        - 2. Uncountable-Object Nouns [+atomic]: it refers to a set of objects that can be individuated into countable items (e.g., *furniture*)

The final part of the instructional intervention materials for LING learners, the participants received explicit instruction on notable differences between Mandarin and English grammar and mistakes commonly made by L1-Mandarin, L2-English language learners. Throughout the lesson, learners were encouraged to ask questions, and there were no apparent issues with their understanding of the concepts presented.

#### 4. RESULTS

In order to explore the first research question, that is the effects of type of instruction on L2 acquisition, a two-way (3 noun types x 3 testing times) Repeated Measures Analysis of Variance (RM ANOVA) and Tukey Honest Significant Difference (HSD) post-hoc analysis were conducted individually for each group on the ESIT accuracy scores and AJT acceptability ratings. To investigate which method

of instruction led to greater gains, we conducted a series of two-way (3 noun types x 3 learner groups) factorial RM ANOVAs on mean gain scores for each of the tasks and testing periods.

#### 4.1. *Elicited-Sentence Imitation Task*

Pre-test (T<sub>0</sub>), immediate post-test (T<sub>1</sub>), and delayed post-test (T<sub>2</sub>) results for the three learner groups and each noun type examined in the indefinite singular context can be found in Tables 3, 4, and 5, showing the mean percentage accuracy in their imitations.

In the majority of the data, there is an increase in imitation scores. Descriptive statistics show that LING learners improved in all noun types from T<sub>0</sub> to T<sub>1</sub> and T<sub>0</sub> to T<sub>2</sub>. The RM ANOVA showed a significant effect of time ( $F_{2,801} = 30.50, p < .001, \eta_p^2 = .071$ ) between pre- and post-test scores. There was also a significant effect of noun type ( $F_{2,801} = 56.88, p < .001, \eta_p^2 = .124$ ) meaning that there were differences in how each noun type was treated irrespective of time. Finally, there was also a significant interaction of time and noun type ( $F_{4,801} = 2.69, p < .05, \eta_p^2 = .013$ ), meaning that time affected the relationship between knowledge of noun types. A Tukey post-hoc analysis revealed a significant increase in overall imitation scores from T<sub>0</sub> to T<sub>1</sub> (mean difference = 13.52,  $p < .001$ ) and from T<sub>0</sub> to T<sub>2</sub> (mean difference = 14.81,  $p < .001$ ). The post-hoc analysis revealed significant increase in imitations scores from T<sub>0</sub> to T<sub>1</sub> for object-uncountable (mean difference = 12.22,  $p < .05$ ) and substance-uncountable nouns (mean difference = 18.33,  $p < .001$ ). Similar results were also found T<sub>0</sub> to T<sub>2</sub> for both noun types (object-uncountable: mean difference = 21.11,  $p < .001$ ; substance-uncountable: mean difference = 15.56,  $p < .001$ ).

NOUN TYPE	LING (n = 30)		
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>
[+count, +atomic] a dog	87.22 (sd = 25.49)	97.22 (sd = 11.52)	95.00 (sd = 16.84)
[−count, +atomic] *a furniture	61.11 (sd = 24.61)	73.33 (sd = 28.24)	82.22 (sd = 25.21)
[−count, −atomic] *a toothpaste	64.44 (sd = 28.29)	82.78 (sd = 27.19)	80.00 (sd = 26.82)

Table 3. Mean percentage of accuracy of imitation for LING learners in the elicited-sentence imitation task

In looking at the post-hoc analysis of the interactions for LING learners, the analysis revealed that prior to instruction, LING learners displayed significantly higher imitation scores for countable nouns than object- (mean difference = -26.11,  $p < .001$ ) and substance-uncountable (mean difference -22.78,  $p < .001$ ) nouns. At T<sub>1</sub>, the post-hoc analysis found that LING learners still performed significantly better with countable nouns than object- (mean difference -23.89,  $p < .001$ ) and substance-uncountable (mean difference = 14.44,  $p < .01$ ) nouns.

NOUN TYPE	TRAD (n = 18)		
	To	T <sub>1</sub>	T <sub>2</sub>
[+count, +atomic] a dog	80.56 (sd = 31.35)	89.81 (sd = 26.39)	90.91 (sd = 26.38)
[-count, +atomic] *a furniture	67.59 (sd = 27.74)	67.59 (sd = 29.39)	73.15 (sd = 28.67)
[-count, -atomic] *a toothpaste	63.89 (sd = 26.45)	69.44 (sd = 35.58)	65.74 (sd = 36.11)

Table 4. Mean percentage of accuracy of imitation for TRAD learners in the elicited-sentence imitation task

Table 4 shows the descriptive statistics for TRAD learners. In the descriptive statistics for the TRAD learners' ESIT data, we can see learners' improvement in two noun types (countable and substance) from To to T<sub>1</sub> and all noun types from To to T<sub>2</sub>. The RM ANOVA revealed a significant effect of noun type ( $F_{2,456} = 19.61, p < .001, \eta_p^2 = .079$ ) but not for time ( $F_{2,456} = 1.18, p = .301, \eta_p^2 = .007$ ) nor the interaction of noun type and time ( $F_{4,456} = .59, p = .67, \eta_p^2 = .005$ ).

The post-hoc analysis revealed that TRAD learners treated object-uncountable nouns differently than countable nouns at T<sub>1</sub> (mean difference = -22.22,  $p < .01$ ), and substance-uncountable nouns different than countable nouns at T<sub>1</sub> (mean difference = -20.37,  $p < .05$ ) and T<sub>2</sub> (mean difference = -25.17,  $p < .01$ ).

NOUN TYPE	NOEX (n = 17)		
	To	T <sub>1</sub>	T <sub>2</sub>
[+count, +atomic] a dog	88.24 (sd = 21.42)	95.10 (sd = 18.04)	84.31 (sd = 30.81)
[-count, +atomic] *a furniture	64.71 (sd = 25.09)	67.65 (sd = 27.97)	61.76 (sd = 32.54)
[-count, -atomic] *a toothpaste	62.75 (sd = 29.74)	80.39 (sd = 28.42)	67.65 (sd = 35.81)

Table 5. Mean percentage of accuracy of imitation for NOEX learners in the elicited-sentence imitation task

Table 5 shows the descriptive statistics for NOEX learners. Unexpectedly, NOEX learners improved with all noun types from T<sub>0</sub> to T<sub>1</sub> but displayed little change from T<sub>0</sub> to T<sub>2</sub>. For NOEX learners, the RM ANOVA found a significant effect of time ( $F_{2,450} = 5.76, p < .01, \eta_p^2 = .0249$ ) and noun type ( $F_{2,450} = 31.68, p < .001, \eta_p^2 = .123$ ) but not the interaction of time and noun type ( $F_{4,450} = 1.00, p = .407, \eta_p^2 = .009$ ) meaning that the difference between pre- and post-test scores was significant as well as the differences between noun types but not the interaction of these variables. In other words, there was overall improvement irrespective of noun type and there are differences in noun types irrespective of time, but the analysis found no noun type that was better than another at a specific time.

In looking at the post-hoc analysis for noun types for NOEX learners, the analysis revealed that, prior to instruction, these learners performed significantly better with countable nouns than object- (mean difference = -23.53,  $p < .01$ ) and substance-uncountable (mean difference = -25.49,  $p < .001$ ) nouns. For countable nouns, NOEX learners continued to perform significantly better than object-uncountable nouns at T<sub>1</sub> (mean difference = -27.45,  $p < .001$ ) and T<sub>2</sub> (mean difference = -22.55,  $p < .01$ ). Furthermore, from T<sub>0</sub> to T<sub>1</sub>, NOEX learners performed significantly worse with regard to substance-uncountable nouns (mean difference = 17.65,  $p < .05$ ).

In order to investigate which learner group made the greatest gains, the mean percentage gains from T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, and T<sub>1</sub> – T<sub>2</sub> were compared across groups. The descriptive statistics are presented in Tables 6–8.

NOUN TYPE	LING (n = 30)		
	T <sub>0</sub> – T <sub>1</sub>	T <sub>0</sub> – T <sub>2</sub>	T <sub>1</sub> – T <sub>2</sub>
[+count, +atomic]	10.00	7.78	-2.22
a dog	(sd = 16.14)	(sd = 17.36)	(sd = 10.48)
[-count, +atomic]	12.22	21.11	8.89
a furniture	(sd = 20.96)	(sd = 21.86)	(sd = 23.05)
[-count, -atomic]	18.33	15.56	-2.78
*a toothpaste	(sd = 20.22)	(sd = 26.60)	(sd = 23.60)

Table 6. Mean gain scores for LING learners in the elicited-sentence imitation task

NOUN TYPE	TRAD (n = 18)		
	T <sub>0</sub> – T <sub>1</sub>	T <sub>0</sub> – T <sub>2</sub>	T <sub>1</sub> – T <sub>2</sub>
[+count, +atomic]	9.26	9.09	1.52
a dog	(sd = 25.71)	(sd = 25.13)	(sd = 22.92)
[-count, +atomic]	0.00	5.56	5.56
*a furniture	(sd = 21.39)	(sd = 20.61)	(sd = 20.61)
[-count, -atomic]	5.56	1.85	-3.70
*a toothpaste	(sd = 21.39)	(sd = 22.06)	(sd = 21.81)

Table 7. Mean gain scores for TRAD learners in the elicited-sentence imitation task

NOUN TYPE	NOEX (n = 17)		
	To - T <sub>1</sub>	To - T <sub>2</sub>	T <sub>1</sub> - T <sub>2</sub>
[+count, +atomic] a dog	6.86 (sd = 16.73)	-3.92 (sd = 28.58)	-10.78 (sd = 37.60)
[-count, +atomic] *a furniture	2.94 (sd = 19.75)	-2.94 (sd = 26.51)	-5.88 (sd = 24.25)
[-count, -atomic] *a toothpaste	17.65 (sd = 19.96)	4.90 (sd = 24.84)	-12.75 (sd = 24.67)

Table 8. Mean gain scores for NOEX learners in the elicited-sentence imitation task

The RM ANOVA for To to T<sub>1</sub> found a significant effect of learner type ( $F_{2,186} = 3.10, p < .05, \eta_p^2 = .032$ ) but not for noun type ( $F_{2,186} = 2.8, p = .063, \eta_p^2 = .029$ ) nor the interaction of learner type and noun type ( $F_{4,186} = .966, p = .427, \eta_p^2 = .020$ ), meaning that there were significant differences between learner groups but not noun types. The Tukey post-hoc analysis revealed that LING learners made significantly greater gains on the ESIT than TRAD learners (mean difference = -8.58,  $p < .05$ ). The post-hoc analysis did not reveal any other significant differences. Therefore, it appears that LING learners made greater gains than TRAD learners, regardless of noun type, from To to T<sub>1</sub>.

For To to T<sub>2</sub>, the RM ANOVA found a significant effect of learner type ( $F_{2,179} = 7.61, p < .001, \eta_p^2 = .080$ ) but not for noun type ( $F_{2,179} = 1.18, p = .309, \eta_p^2 = .013$ ) nor the interaction of these two variables ( $F_{4,179} = 1.15, p = .335, \eta_p^2 = .025$ ). The post-hoc analysis revealed that LING learners made significantly greater gains than NOEX learners (mean difference = -15.47,  $p < .001$ ). The mean difference in gains between LING and TRAD learners was only marginally significant (mean difference = -9.85,  $p = .055$ ). In other words, from To to T<sub>2</sub>, LING learners made greater gains than both TRAD and NOEX learners regardless of noun type.

In the analysis of ESIT gains from T<sub>1</sub> to T<sub>2</sub>, the RM ANOVA found a significant effect of learner type ( $F_{2,179} = 4.66, p < .05, \eta_p^2 = .049$ ) and noun type ( $F_{2,179} = 3.54, p < .05, \eta_p^2 = .038$ ) but not the interaction of these two factors ( $F_{4,179} = .189, p = .944, \eta_p^2 = .004$ ). The Tukey post-hoc analysis found that irrespective of learner type, there was a significant difference between substance-uncountable and object-uncountable nouns (mean difference = -9.74,  $p < .05$ ). Furthermore, LING learners made significantly greater gains than NOEX learners (mean difference = -11.10,  $p < .05$ ). Unexpectedly, the post-hoc analysis also found that NOEX learners made significantly greater gains than TRAD learners (mean difference = -10.87,  $p < .05$ ).

#### 4.2. Acceptability Judgment Task

In the acceptability judgment task, participants were asked to rate the acceptability of sentences on a 7-point Likert scale. The raw acceptability ratings are used in the data analysis<sup>3</sup>. Pre-test (T<sub>0</sub>), immediate post-test (T<sub>1</sub>), and delayed post-test (T<sub>2</sub>) results for the three learner groups and each noun type examined can be found in Tables 9–11, showing the acceptability ratings for each context.

NOUN TYPE	LING (n = 30)		
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>
[+count, +atomic] a dog	4.79 (sd = 2.05)	5.16 (sd = 2.00)	5.27 (sd = 1.56)
[−count, +atomic] *a furniture	4.82 (sd = 2.00)	4.41 (sd = 2.14)	4.18 (sd = 2.16)
[−count, −atomic] *a toothpaste	4.49 (sd = 2.13)	4.26 (sd = 2.30)	4.63 (sd = 1.89)

Table 9. Mean acceptability ratings for LING learners in the acceptability judgment task

In the descriptive statistics, we see the data trending in the expected directions—acceptability ratings increase over time for countable nouns while they decrease for uncountable nouns. The descriptive statistics show that LING learners increase acceptability of countable nouns from T<sub>0</sub> to T<sub>1</sub> and T<sub>2</sub>. For uncountable nouns, they decrease from T<sub>0</sub> to T<sub>1</sub> and T<sub>2</sub> for object-uncountable nouns and only decrease from T<sub>0</sub> to T<sub>1</sub> for substance-uncountable nouns. The RM ANOVA for LING learners revealed a significant effect of noun type ( $F_{2,801} = 7.98, p < .001, \eta_p^2 = .020$ ) but not for time ( $F_{2,801} = .017, p = .841, \eta_p^2 = .0004$ ) nor the interaction of noun type and time ( $F_{4,801} = 2.15, p = .073, \eta_p^2 = .011$ ). The post-hoc analysis revealed that, at T<sub>2</sub>, LING learners appropriately displayed significantly higher acceptability ratings for countable nouns than object-uncountable nouns (mean difference = -1.09,  $p < .05$ ).

NOUN TYPE	TRAD (n = 18)		
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>
[+count, +atomic] a dog	5.11 (sd = 1.60)	4.85 (sd = 1.70)	5.19 (sd = 1.43)
[−count, +atomic] *a furniture	5.2 (sd = 1.77)	4.76 (sd = 2.00)	4.20 (sd = 1.64)
[−count, −atomic] *a toothpaste	4.15 (sd = 2.12)	4.91 (sd = 1.72)	4.57 (sd = 1.60)

Table 10. Mean acceptability ratings for TRAD learners in the acceptability judgment task

3. With acceptability ratings, a lower rating is a sign of rejection of a grammatical or ungrammatical structure while a higher rating is a sign of acceptance.

In the descriptive statistics, we see that TRAD learners decreased their acceptability ratings for countable and object-uncountable noun types from To to T<sub>1</sub> and increased for substance-uncountable nouns, even though they should have increased only for countable nouns. From To to T<sub>2</sub>, we see an increase in acceptability ratings for countable nouns and substance-uncountable nouns and a decrease for object-uncountable nouns. The RM ANOVA did not find a significant effect of time ( $F_{2,477} = .555, p = .574, \eta_p^2 = .002$ ), meaning there were no differences between pre- and post-test scores. On the other hand, there was a significant effect of noun type ( $F_{2,477} = 3.52, p < .05, \eta_p^2 = .015$ ), meaning that there were differences in how each noun type was treated. The Tukey post-hoc analysis only revealed a significant difference between object- and substance-uncountable nouns prior to instruction (mean difference = -1.06,  $p < .05$ ), with object-uncountable nouns having a significantly higher mean acceptability rating. There were no other significant pairwise comparisons.

NOUN TYPE	NOEX (n = 17)		
	To	T <sub>1</sub>	T <sub>2</sub>
[+count, +atomic] a dog	4.84 (sd = 2.04)	4.90 (sd = 1.73)	5.12 (sd = 1.69)
[−count, +atomic] *a furniture	5.51 (sd = 1.83)	5.14 (sd = 1.64)	5.00 (sd = 1.92)
[−count, −atomic] *a toothpaste	4.98 (sd = 1.97)	4.65 (sd = 1.97)	4.75 (sd = 1.83)

Table 11. Mean acceptability ratings for NOEX learners in the acceptability judgment task

For NOEX learners, the descriptive statistics show a slight increase in acceptability scores from To to T<sub>1</sub> and T<sub>2</sub> for countable nouns and a decrease in scores from To to T<sub>1</sub> and T<sub>2</sub> for uncountable nouns (both object and substance). The RM ANOVA failed to reveal a significant effect of time ( $F_{2,450} = .554, p = .575, \eta_p^2 = .003$ ), noun type ( $F_{2,450} = 2.05, p = .130, \eta_p^2 = .009$ ), or their interaction ( $F_{4,450} = .614, p = .653, \eta_p^2 = .005$ ). Being as there were no significant effects or interactions, there were also no significant post-hoc pairwise comparisons.

In order to investigate which learner group made the greatest gains, the mean accuracy rating differences from To to T<sub>1</sub>, To to T<sub>2</sub>, and T<sub>1</sub> to T<sub>2</sub> were compared across groups. The descriptive statistics are presented in Tables 12–14.

NOUN TYPE	LING (n = 30)		
	To – T <sub>1</sub>	To – T <sub>2</sub>	T <sub>1</sub> – T <sub>2</sub>
[+count, +atomic]	0.37	0.48	0.11
<i>a dog</i>	(sd = 1.69)	(sd = 1.49)	(sd = 1.35)
[–count, +atomic]	-0.41	-0.64	-0.23
* <i>a furniture</i>	(sd = 1.64)	(sd = 1.28)	(sd = 1.39)
[–count, –atomic]	-0.23	0.14	0.38
* <i>a toothpaste</i>	(sd = 2.13)	(sd = 1.63)	(sd = 1.99)

Table 12. Mean gain scores for LING learners in the acceptability judgment task

NOUN TYPE	TRAD (n = 18)		
	To – T <sub>1</sub>	To – T <sub>2</sub>	T <sub>1</sub> – T <sub>2</sub>
[+count, +atomic]	-0.26	0.07	0.33
<i>a dog</i>	(sd = 1.30)	(sd = 1.26)	(sd = 0.88)
[–count, +atomic]	-0.44	-1.00	-0.56
* <i>a furniture</i>	(sd = 1.20)	(sd = 1.41)	(sd = 1.80)
[–count, –atomic]	0.76	0.43	-0.33
* <i>a toothpaste</i>	(sd = 1.66)	(sd = 1.18)	(sd = 1.36)

Table 13. Mean gain scores for TRAD learners in the acceptability judgment task

NOUN TYPE	NOEX (n = 17)		
	To – T <sub>1</sub>	To – T <sub>2</sub>	T <sub>1</sub> – T <sub>2</sub>
[+count, +atomic]	0.06	0.27	0.22
<i>a dog</i>	(sd = 1.39)	(sd = 1.07)	(sd = 1.30)
[–count, +atomic]	-0.37	-0.51	-0.14
* <i>a furniture</i>	(sd = 1.09)	(sd = 1.84)	(sd = 1.38)
[–count, –atomic]	-0.33	-0.24	0.10
* <i>a toothpaste</i>	(sd = 1.62)	(sd = 2.14)	(sd = 1.55)

Table 14. Mean gain scores for NOEX learners in the acceptability judgment task

In looking at the descriptive statistics, it can be seen that LING learners made the greatest gains when compared to the other learner groups. In other words, acceptability ratings of countable nouns increased at all testing times and they decreased, as predicted, for uncountable-object nouns. While the other learner groups have made similar gains, they are not to the same extent as LING learners. The RM ANOVA for gains from To to T<sub>1</sub> failed to produce any significant main effects for learner type ( $F_{2,186} = .276, p = .759, \eta_p^2 = .003$ ), noun type ( $F_{2,186} = 1.93, p = .148, \eta_p^2 = .020$ ), or their interaction ( $F_{4,186} = 1.63, p = .170, \eta_p^2 = .034$ ). Since the ANOVA did not find any significant main effects, the Tukey post-hoc analysis also failed to reveal any significant pairwise comparisons. For the To to T<sub>2</sub> data, the RM ANOVA revealed a significant main effect of noun type ( $F_{2,186} = 8.50, p <$

.001,  $\eta_p^2 = .084$ ) but not for learner type ( $F_{2,186} = .257, p = .773, \eta_p^2 = .003$ ) nor the interaction of learner type and noun type ( $F_{4,186} = .764, p = .550, \eta_p^2 = .016$ ). The post-hoc analysis failed to reveal any meaningful significant pairwise comparisons. The analysis of AJT gains from T1 to T2 failed to reveal any significant effects of learner type ( $F_{2,186} = .594, p = .553, \eta_p^2 = .006$ ) and noun type ( $F_{2,186} = 2.02 p = .136, \eta_p^2 = .021$ ). It also failed to reveal any significant interaction of learner type and noun type ( $F_{4,186} = .591, p = .670, \eta_p^2 = .013$ ). Furthermore, the post-hoc analysis failed to reveal any significant pairwise comparisons.

## 5. DISCUSSION AND CONCLUSIONS

To determine the effect of each type of instruction on the reassembly of L1 noun type features for the L2, we will look at the results for each of the groups separately. For the linguistically-informed instruction group, we found that, prior to instruction, the imitation scores were significantly higher for countable nouns than object- or substance-uncountable nouns. The low scores at pre-test suggest that the learners had not yet properly reassembled their L1 features for the L2 since they treated object-uncountable and substance-uncountable nouns like countable nouns. If they had begun the reassembly process, we would have expected that the pre-test results show some difference between noun types within each learner group. Furthermore, the results also found significant gains in the imitation scores of both object- and substance-uncountable nouns from pre-test to immediate post-test. Furthermore, while not always significant, these improvements in imitation scores were maintained into the delayed post-test. For the acceptability judgment task, there was an overall lack of significant differences in the analysis, but the descriptive statistics trended in the expected direction —increase in acceptability of countable nouns and decrease in acceptability of uncountable nouns. These findings are very suggestive that this form of instruction, that is, instruction that explicit teaches the semantic features of English noun types, may be more beneficial in the immediate development of implicit knowledge than explicit knowledge. This is contrary to previous research which found that explicit instruction was most beneficial for explicit knowledge (Bowles, 2011; Bruhn de Garavito, 2013; Loewen, 2015; Long, 1983, 2009; Lopez, 2017; Lopez & Sabir, 2017; Master, 1994, 2002; Norris & Ortega, 2000; Snape & Yusa, 2013; Sonbul & Schmitt, 2013; Spada & Tomita, 2010).

In other words, in a meaning-focused imitation task, learners showed greater improvement following explicit instruction on the semantic features of noun types in

an indefinite-singular context than when they were asked to make explicit judgements on the acceptability of sentences. This is in line with previous research by Ionin, Choi & Liu (2020) who found that L2 learners of English from GCLs showed slow-down effects in a self-paced reading task but did not find similar learner sensitivity as measured by a grammaticality judgment task. One explanation for this might be that the learners began to overthink during the acceptability judgment task, which lead them to overanalyze what they had learned. Being as the pre-test results showed clear indication that learners were interpreting uncountable-object nouns on the basis of atomicity instead of countability, it might be the case that when prompted to make acceptability judgments, they were unable to overcome their L1 influence. Our results found that explicit instruction on noun type semantics proved more beneficial for building up implicit knowledge as measured by an elicited-sentence imitation task. The lack of significant interactions between noun types and testing time in the acceptability judgment task shows that the learners were unable to completely employ their new knowledge in an explicit manner.

The results of the traditional instruction group, on the other hand, only revealed significant differences between noun types on the elicited-sentence imitation task, but these were differences regardless of time. In other words, while the descriptive statistics showed that these learners increased their imitations scores for noun types across the course of the study, none of these increases were significant, neither were the differences between noun types. In the acceptability task, on the other hand, these learners were unable to recognize, following instruction, that uncountable nouns were unacceptable and countable nouns were acceptable, resulting in no significant differences. The lack of significance in the results for the traditional instruction learners suggests that the current method of instruction employed in English language classrooms is not effective in facilitating the reassembly of L1 features for the L2, which is contrary to the existing literature the suggests explicit instruction does lead to gains in linguistic knowledge (Bowles, 2011; Long, 1983, 2009; Master, 1994, 2002; Norris & Ortega, 2000; Spada & Tomita, 2010). This is likely due to the fact that these materials do not explicitly teach the differences between atomicity and countability, and how these features combine to make various types of nouns in English.

The results of the no-extra-instruction group presented an unexpected picture. In the imitation task, we found that no-extra-instruction learners improved on all noun types from pre-test to immediate post-test although the statistical analysis did not reveal this improvement to be significant. More specifically, the results showed an

increase in imitation scores from pre-test to immediate post-test but then a decrease in scores from immediate to delayed post-test. In other words, any improvement was not sustained. For the acceptability judgment task, while the results did not show any significant changes, the descriptive statistics did show an increase in the acceptability of countable nouns and a decrease in the acceptability of uncountable nouns. When taken together, the results for the no-extra-instruction group do show that no instruction did not facilitate the reassembly process at all. It is important to remind the readers here that all participants enrolled in the research project were also enrolled in their regularly-schedule ESL grammar courses. To that end, the chapter in *Grammar & Beyond 4* covered in this research project is not explicitly taught to those students but listed as a «self-study» chapter with no assessments provided over the content. Therefore, any improvement in imitation scores or acceptability ratings was likely due to factors external of the research project.

In summary, these findings are in-line with the theoretical assumption, based on the Cline of Difficulty (Slabakova, 2009b; Cho & Slabakova, 2014), that the learners have a greater difficulty with the definiteness feature than other semantic features because it is both context- and morpheme-bound in the L1, while it is only morpheme-bound in the L2. Therefore, the results did show that explicit teaching in a linguistically-informed manner proved to be more successful in helping the learners overcome the Cline of Difficulty (Slabakova, 2009b; Cho & Slabakova, 2014) and the bottleneck of second language acquisition (Slabakova, 2008, 2009a, 2009b, 2013).

The second research question investigated which type of instruction would lead to the greatest gains in the reassembly of L1 noun type features of the L2. In terms of teaching intervention, the overall results found the greatest number of significant gains with the learners that received explicit linguistically-informed instruction on the semantic features of English noun types. Before we discuss the results, we would like to once again reiterate that the decision to offer only one hour of instructional intervention was to maintain fidelity and ecological validity with the length of instruction these participants were previously exposed to. In our analysis of gains over the course of the study, we only found significant differences between learner groups in the elicited-sentence imitation task. The analysis of the imitation score gains found that linguistically-informed learners made greater gains than traditional learners from pre-test to immediate and delayed post-test. In the same analysis, we also found that linguistically-informed learners made greater gains in their imitation scores from pre-test to delayed post-test and immediate post-test to delayed post-test than no-extra-instruction learners. Unexpectedly, we also found

that no-extra-instruction learners made greater gains than traditional instruction learners from immediate to delayed post-test. Although we found no significant differences between learner groups, LING learners did perform descriptively better than the other two learner groups with regard to the acceptability judgment task.

As stated, the results for the group who received instruction on countability and atomicity differed for the two tasks, but also differed from both the traditional instruction and no extra instruction groups, suggesting that instruction on countability and atomicity was beneficial. This finding supports our prediction that explicit instruction will facilitate the reassembly of the L1 [count] and [atomic] features for the L2 as posited by the Feature Reassembly Hypothesis (Lardiere, 2008, 2009a, 2009b). In other words, following explicit instruction, LING learners were able to recognize the indefinite article context is count-noun-selective, and therefore, only permits singular countable nouns, that is nouns with the feature settings [+count, +atomic]. Being as the majority of significant improvement was found in the elicited-sentence imitation task and not the acceptability judgment task, it may be the case that the functional morphology of the indefinite article *a* is providing difficulty for the learners when they are employing their explicit knowledge. This is in support of the Bottleneck Hypothesis (Slabakova, 2008, 2009a, 2009b) which suggests that functional morphology is the *real slowdown* of the language acquisition process.

The lack of significant performance of the traditional instruction group is a clear indication that the current method of instruction employed in English language classrooms across the world is not as effective as instruction informed by GenSLA research. While the lack of findings in the traditional instruction group contradict previous research (Akakura, 2012; Master, 1994, 2002), it is important to note that the materials (Bunting *et al.*, 2009) used for this group's instruction taught differences in noun types based on the articles they can combine with and gave a short description of countable and uncountable nouns. These materials did not address the differences in atomicity and types of uncountable nouns. The linguistically-informed instruction, on the other hand, explicitly taught the differences of English noun types using the semantic features that distinguish them, atomicity and countability, as well as the articles they can combine with. This explicit instruction on feature assembly and presentation of articles that produce count-selective and uncountable-selective contexts seems to have led to significant gains in linguistic knowledge.

The results and findings of this study do not come without limitations. The first and most obvious limitation is the small number of participants included in the traditional and no extra instruction groups in comparison to the linguistically-informed

instruction group. While we originally collected data from 100 participants overall, quite a bit of the data was incomplete and had to be excluded from the analysis. In addition, it remains to be seen what the longer-term effects are of only one hour of instructional intervention. While it is quite unfortunate that we only administered a single one-hour instructional intervention, this was our attempt to adhere true to our «teacher-self». Further research would benefit from considering an extension of the instructional intervention period or conducting a «review lesson» as is often done in courses before a quiz, test, or exam. Furthermore, more research into the effects of noun type instruction in different article and singular/plurality contexts would be interesting to see if similar effects are observed with nouns presented in contexts with the definite article or the zero article. As a final remark, we hope that these findings will be accessible to researchers and instructors from both GenSLA and ISLA backgrounds. In an attempt to bridge GenSLA theoretical research and ISLA pedagogy, we must remind ourselves that GenSLA is not meant to be a pedagogy, but the results from GenSLA research should inform ISLA and current teaching pedagogy.

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Dakota J. Thomas-Wilhelm  
 University of Illinois System  
 510 Devonshire Drive, Suite H  
 Champaign, IL 61820, United States

Elisabet Pladevall-Ballester  
 Departament de Filologia Anglesa i de Germanística  
 Carrer de la Fortuna. Edifici B. Facultat de Filosofia i Lletres  
 Universitat Autònoma de Barcelona  
 08193 Bellaterra (Cerdanyola del Vallès), Spain

