

Acquisition of kind-reference by Arabic, Chinese, and Turkish L2 learners of English

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Abstract

This study examines the acquisition of kind-referring expressions such as *The dodo is extinct*. The objective is to investigate whether second language (L2) learners' acquisition of nominal number marking and articles expressing kind-reference in English is affected by their first language (L1), their L2 proficiency in English, or the syntactic position of the kind-referring noun phrase (NP). L2 learners of English with Arabic, Chinese, and Turkish L1 backgrounds and a control group of native English speakers (NSs) participated in the study. The results from a Fill in the Gaps Task (FGT) and an Acceptability Judgment Task (AJT) demonstrated that L2 learners were more successful in their production and acceptability judgments when the expression of kind-reference in the target language was similar to that in their L1. The results also showed non-facilitative L1 transfer in the domain of bare singulars, as well as a positive effect of higher L2 proficiency on kind-referring NPs. Finally, the study revealed a subject/object asymmetry in the acquisition of kind-referring NPs in L2 English.

Keywords: second language acquisition, kind-reference, Arabic, Chinese, Turkish

Résumé

Cette étude examine l'acquisition d'expressions faisant référence aux sortes, telles que *Le dodo est disparu*. L'objectif était d'étudier si la première langue (L1) des apprenants d'une langue seconde (L2), leur maîtrise L2 de l'anglais ou la position syntaxique du syntagme nominal (SN) faisant référence aux sortes a un effet sur leur acquisition du marquage des nombres nominaux et des articles pour exprimer la référence de sorte en anglais. Des apprenants d'anglais L2 ayant l'arabe, le chinois et le turc comme L1, ainsi qu'un groupe témoin de locuteurs natifs de l'anglais, ont participé à l'étude. Les résultats d'une tâche de remplissage des lacunes et d'une tâche de jugement d'acceptabilité ont démontré que les apprenants de L2 réussissent mieux dans leur production et leurs jugements d'acceptabilité lorsque l'expression de la référence de sorte dans la langue cible était similaire à celle de leur L1. Les résultats ont également démontré un transfert de L1 non facilitateur dans le domaine des singuliers nus ainsi qu'un

effet positif d'une maîtrise plus élevée de la L2 sur les NP se référant aux sortes. Enfin, l'étude a révélé une asymétrie sujet/objet dans l'acquisition des NP référant aux sortes en anglais L2.

Mots-clés: acquisition d'une langue seconde, référence aux sortes, arabe, chinois, turc

1. INTRODUCTION

This study investigates the second language acquisition of *kind*-referring expressions such as *The dodo is extinct*.¹ The participants had Arabic, Chinese, and Turkish first language (L1) backgrounds and were studying English as a second language (L2). The L1s under investigation diverge drastically with respect to the article system, presence or absence of plural marking, and licensing of bare nominals, creating an optimal test case to investigate the effect of L1 transfer in the acquisition of subtle meaning distinctions to refer to kinds in a target language. The selection of these particular L1 backgrounds is crucial, as they differ in terms of the availability of overt determiners. While English has overt indefinite and definite articles, Arabic has an overt definite article, but lacks an indefinite article.² Chinese lacks both indefinite and definite articles. Turkish has an overt indefinite article but lacks a definite article.

The role of the L1 and the effects of L2 proficiency on the acquisition of the correct nominal morphosyntax and articles for genericity have been addressed in various studies (e.g., Snape et al. 2009, 2013; Ionin and Montrul 2010; Ionin et al. 2013; Ionin et al. 2014; Hermas 2020a, b, c). However, this line of investigation has not always indicated a facilitative effect of L1 or a positive effect of higher L2 proficiency on the acquisition of genericity in L2. Thus, this study investigates whether L1 transfer, L2 proficiency, and the structural position of the *kind*-referring NP play a role in the acquisition of *kind*-reference by Arabic, Chinese, and Turkish L2 learners of English.

2. GENERICITY AND KIND-REFERENCE

In this study, I adopt the semantic framework of Krifka et al. (1995), according to whom genericity can be construed in terms of two distinct phenomena: characterizing sentences, and *kind*-referring NPs. Characterizing sentences, or generic sentences, report a regularity or a generalization about individuals in the *kind*. The source of

¹Abbreviations used: AJT: acceptability judgement task; FGT: fill in the gaps task; LOC: locative; COP: copula; MSA: Modern Standard Arabic; NOM: nominative; NS: native speaker; PLU: plural;

²The question as to whether Modern Standard Arabic (MSA) has an indefinite article is far from resolved. One view postulates an indefiniteness marker attached to the end of the word (Ryding 2005), which takes the form *-un* for nominative; *-an* for accusative; and *-in* for genitive case. A second view argues instead that MSA does not have an indefinite article (Lyons 1999, Guella et al. 2008, Sarko 2008, Jarrah and Zibin 2016). Fassi Fehri (1993) argues, for example, that word endings, (*tanwin*), cannot constitute an indefinite marker because even proper names receive such marking (e.g., Khalid-un).

genericity in such expressions is the sentence. Generic sentences can be expressed using an indefinite singular, a definite singular, or a bare plural in English, as illustrated in (1).

- (1) a. A cat meows.
 b. The cat meows.
 c. Cats meow.

The current study deals only with the acquisition of kind-reference in L2 English, rather than with characterizing sentences.

2.1 Kind-reference in English

According to Krifka et al. (1995), in English, in contrast to characterizing sentences, kind-reference with count nouns can only be established with a definite singular, or a bare plural, as shown in (2a–b). Indefinite singulars cannot refer to kinds in English, as illustrated in (2c). Moreover, bare singulars are ungrammatical for kind-reference with count nouns (2d), as are definite plurals (2e).

- (2) a. *The dodo* is extinct.
 b. *Dodos* are extinct.
 c. *A dodo is extinct.
 d. *Dodo is extinct.
 e. *The dodos are extinct.

In English, mass nouns have to be bare for kind-reference, as shown in (3).

- (3) Milk is healthy.

In a sentence such as *Dodos are extinct*, the predicate *extinct* modifies the whole kind. Thus, every member of the kind must be extinct for one to say *Dodos are extinct*. The italicized NPs *the dodo* and *dodos* in (2) do not denote particular dodos but rather the kind *dodo* (*Raphus Cucullatus*). The source of kind-reference in such expressions is the NP itself. A feature of kind-referring expressions is that they do not tolerate exceptions.

2.2. Kind-reference in Arabic

Modern Standard Arabic (MSA) has a definite article *al-* that precedes the noun and does not share gender and number features with the noun. Kind-referring count nouns are only licensed with a definite singular (4) or a definite plural (5).^{3/4}

³In Arabic, plurality is indicated morphologically through vowel change. The form of the verb changes depending on person, number, and gender. As the crucial information in the glosses is whether the noun is singular or plural, and if there is an article accompanying the noun, only these points are indicated, leaving aside tangential details regarding the vowel changes in nouns and the verb form based on number and gender.

⁴A reviewer notes dialectal varieties of Arabic also require a definite singular or a definite plural for kind-reference.

- (4) **al-senjab-u** shaeun fi Kanada
 the-squirrel-NOM common in Canada
 ‘The squirrel is common in Canada.’
- (5) **al-sanaajib-u** shaaatun fi Kanada
 the-squirrels-NOM common in Canada
 ‘Squirrels are common in Canada.’

Mass nouns also require a definite article in Arabic when referring to kinds, as shown in (6).

- (6) **al-haliib-u** sihi
 the-milk-NOM healthy
 ‘Milk is healthy.’

2.3 Kind-reference in Chinese

Chinese lacks articles. The plural marking, *-men*, is reserved for personal pronouns and a number of human referents. Based on context, bare nouns may receive a definite or indefinite interpretation and can refer to singular as well as plural entities (Huang et al. 2009). Kind-referring NPs are bare, irrespective of whether they are count nouns (7) or mass nouns (8).

- (7) **sōngshǔ** zài Jiānádà hěn chángjiàn
 squirrel at Canada very common
 ‘Squirrels are common in Canada.’
- (8) **niúnǎi** hěn hǎohē
 milk very delicious
 ‘Milk is delicious.’

2.4 Kind-reference in Turkish

Turkish has an indefinite article *bir* (a/an or one) but it lacks an article to mark definiteness or specificity (Kornfilt 1997). Turkish employs case morphology, word order, stress, tense, aspect and modality to encode these functions. There is a productive plural marker *-lar* although bare singulars in the object position can receive a plural interpretation. In Turkish, kind-referring count nouns only allow a bare singular or a bare plural (9).

- (9) **sincap-(lar)** Kanada-da yaygın-dır
 squirrel-(PLU) Canada-LOC common-COP
 ‘Squirrels are common in Canada.’

Kind-referring mass nouns only allow a bare singular in Turkish, as illustrated in (10).

- (10) **süt** sağlıklı-dır
 milk healthy-COP
 ‘Milk is healthy.’

Table 1 shows the distribution of articles for kind-reference in the languages discussed in this section.

| Kind-referring noun phrases | | | | | | | | | |
|-----------------------------|------|---------------------|------|-------------------|------|-------------|------|-----------------|------|
| Bare singular | | Indefinite singular | | Definite singular | | Bare plural | | Definite plural | |
| Count | Mass | Count | Mass | Count | Mass | Count | Mass | Count | Mass |
| English | | | | | ✓ | | ✓ | | |
| Turkish | ✓ | ✓ | | | | | ✓ | | |
| Arabic | | | | | ✓ | ✓ | | | ✓ |
| Chinese | ✓ | ✓ | | | | | | | |

Table 1: Crosslinguistic variation in kind-referring count and mass nouns

3. THE EFFECT OF L1 TRANSFER AND L2 PROFICIENCY ON L2 ACQUISITION OF KIND-REFERENCE

This section details the effect of L1 transfer, L2 proficiency, as well as the issue of subject/object asymmetry in the acquisition of kind-reference in L2 English.

3.1 Full/partial L1 effects on L2 acquisition of kind-reference

A number of studies have investigated how the properties of the first language influence the L2 acquisition of NPs with generic reference (Snape et al. 2009, 2013; Ionin and Montrul 2010; Ionin et al. 2013). The results of these studies showed that the L1 background had a clear effect on article choice in generic NPs in the L2. Moreover, those studies indicated that while L2 learners with lower proficiency levels transferred the interpretation of genericity from their L1s to the L2, at higher proficiency levels, they were able to recover from L1 transfer and acquire the target L2 interpretation of genericity both for mass and count nouns.

Turning to kind-reference, some studies found only partial L1 effects. Ionin et al. (2014) was a bi-directional study to investigate generic NP acquisition in L2 English by speakers with Spanish and Portuguese L1s. They also investigated generic NP acquisition in L2 Portuguese by speakers with Spanish and English backgrounds, including interpretation of kind-referring NPs. Results from the L2 English study indicated that the participants had difficulty with definite singulars for kind-reference. Similarly, L2 learners of Portuguese differed from native speakers (NSs) in the use of bare plurals to refer to kinds. Ionin et al. (2014) argue that definite singulars for kind-reference in English and bare plurals for kind-reference in Portuguese are used in formal registers, which may explain the L2 learners' being less successful in those domains. However, the results demonstrated that some L2 learners were able to override L1 influence and acquire the means to express generic NPs in L2 Portuguese and L2 English. The results also revealed significant correlations between L2 proficiency and the ratings of bare plurals and definite singulars in the kind-reference category.

In a series of recent studies, Hermas (2019, 2020a, b) investigated the acquisition of genericity in L2 French as well as third language (L3) English by L1 speakers of

Moroccan Arabic. Participants in Hermas (2020a) were advanced in L3 English, with Moroccan Arabic as their L1 and French as their L2. Using an acceptability judgment and interpretation task, Hermas (2020a) investigated both NP-level (kind-reference) and sentence-level (generic reference) genericity. The results indicated that the L3 learners performed in a target-like manner on the generic interpretation of bare plurals even though bare plurals have an existential interpretation in Moroccan Arabic, and are illicit in L2 French. In terms of definite singulars and bare singulars, the participants did not have any difficulty in L3 English. However, they still accepted definite plurals as generic, which Hermas (2020a) attributes to non-facilitative L1 transfer. The overall results demonstrated that the L3 learners did not differentiate NP-level genericity from sentence-level genericity. Thus, Hermas (2020a) concluded that knowledge of genericity in L3 English is an amalgamation of target-like and non-target-like exponents.

Herms (2020b) examined the acquisition of genericity in L2 French and L3 English by L1 Moroccan Arabic speakers, focusing on the acquisition of definite singulars for kind-reference. Definite singulars can only be used with a well-defined or taxonomic⁵ kind in English, a postulation due to Vendler (1957) and reiterated in Dayal (2004) and Borik and Espinal (2015). An acceptability judgement task showed that the learners had native-like interpretations of definite singulars used with well-defined kinds. Still, they interpreted non-well-defined nominals generically. Herms (2020b) attributes this finding to a deficit in pragmatic knowledge in L3 English and to L1 Arabic transfer, but maintains that pragmatic properties determining interpretation outcomes are eventually acquirable in L2/L3.

3.2 Absence of L1 effects on L2 acquisition kind-reference

Ionin et al. (2011) investigated whether L1 Russian and L1 Korean learners, whose L1s lack articles, can distinguish between the different types of English generics. The researchers found that both L2 groups at intermediate and advanced English proficiency rated bare plurals higher than definite singulars for kind-reference. Ionin et al. (2011) argue that these results cannot be due to L1 transfer, since Russian and Korean lack articles and use bare nouns for generic interpretation, while exhibiting substantially different nominal syntax. The researchers attribute learners' difficulty with definite generics, in part, to input factors. Although the researchers do not discuss the effect of L2 proficiency in detail, they indicate that the performance of the L2 learners improved with proficiency in most sentence types.

Overall, studies investigating the effect of L1 transfer on the acquisition of kind-reference in L2 English have provided conflicting results, with L1 transfer sometimes being clearly apparent, while at other times playing a limited or no role. Similarly, previous research looking into the effects of L2 proficiency found that higher proficiency usually correlated with better performance in recognizing or selecting the correct NP forms for generic reference. Nevertheless, such improvement was not always consistent. Particularly in the case of definite singulars, L2 learners

⁵A taxonomic kind is one that cannot be further divided into sub-kinds (e.g., the red panda, the king cobra, etc.).

have been found to diverge from NS of English by not selecting them or giving them lower acceptability ratings in judgment tasks.

3.3 Subject/object asymmetry in the acquisition of kind-reference in L2 English

An under-researched topic in this line of investigation is whether the structural position of an NP (e.g., subject/object) affects the acquisition of kind-reference. In their pioneering work, Carlson and Pelletier (1995) argue that bare plurals can be interpreted as kind-referring in the subject position as long as there is a kind-selecting verb (e.g. *annihilate*, *exterminate*). However, they maintain that it is not easy to derive a kind-reference interpretation for bare plurals in the object position, where the default interpretation of a bare plural is indefinite. The same observation has been made for German by Gerstner-Link (1988). Such observations provide a theoretical rationale to test whether L2 learners of English from Arabic, Chinese, and Turkish L1 backgrounds treat the subject and the object positions differently.

Snape et al. (2009) is one of few empirical studies that has considered the subject/object asymmetry in the acquisition of generic noun phrases in L2 English. In a forced-choice elicitation task, Snape et al. (2009) asked participants to fill in blanks with an appropriate article (e.g., *the/a/an/Ø*) for NPs with a generic interpretation in subject and object positions. The participants had Spanish, Turkish, Japanese, and Chinese L1 backgrounds. Of particular interest here is the performance of the Chinese and Turkish groups. The researchers found that when the target form required a definite singular, the advanced Chinese group performed better in the object position. However, when the target form was a bare plural, the same group performed better in the subject position. Both when the target form required a definite singular and a bare plural, the advanced Turkish group performed better in the object position compared to the subject position. As for the upper intermediate Chinese and Turkish groups, when the target form required a definite singular and a bare plural, the two groups performed better in the object position.

4. THE CURRENT STUDY

This study aims to answer three research questions, formulated in (11).

(11) Research questions

- a. Does L1 transfer play a role in the acquisition of kind-reference by Arabic, Chinese, and Turkish L2 learners of English?
- b. Does L2 proficiency play a role in the acquisition of definite singulars and bare plurals for count nouns, and bare singulars for mass nouns for kind-reference by Arabic, Chinese, and Turkish L2 learners of English?
- c. Does the syntactic position of the noun phrase play a role in the acquisition of kind-reference by Arabic, Chinese, and Turkish L2 learners of English?

As to question (11a), relative to the role of L1 transfer: Table 2 and Table 3 outline the predictions regarding L1 transfer. The main factors that determine whether the NP

under investigation would be relatively easy or difficult to acquire are a) whether the participants' L1 has the same NP form for kind-reference compared to the target language, and b) what kind of evidence (i.e., positive, or negative) is needed to acquire that form.

| | Definite singular | | | Bare plural | | |
|---------|---|-------------------|----------------------|---|-------------------|----------------------|
| | Does the L1 have the same NP form for kind-reference? | Evidence required | Predicted difficulty | Does the L1 have the same NP form for kind-reference? | Evidence required | Predicted difficulty |
| Arabic | yes | positive | easy | no | positive | relatively difficult |
| Chinese | no | positive | relatively difficult | no | positive | relatively difficult |
| Turkish | no | positive | relatively difficult | yes | positive | easy |

Table 2: Predicted difficulty of the acquisition of definite singulars and bare plurals for kind-reference (count nouns)

As Table 2 shows, definite singulars should be relatively easy for Arabic learners as their L1 instantiates the same form for kind-reference. For Chinese and Turkish learners, definite singulars should be relatively difficult. However, with positive input, they should be acquirable for both L1 groups. On the other hand, bare plurals are predicted to be relatively difficult for Arabic and Chinese learners. However, Arabic learners may have a bigger challenge. Although positive evidence should suffice to acquire bare plurals for both L2 learner groups, Arabic requires a definite article with plural nouns for kind-reference, which means that they need negative evidence to rule out definite plurals, and that may make Arabic participants less successful in bare plurals. For Turkish learners, bare plurals should be easy as they have the same form in their L1 for kind-reference.

| | Bare singular | | |
|---------|---|---------------------|----------------------|
| | Does the L1 have the same NP form for kind-reference? | Evidence required | Predicted difficulty |
| Arabic | no | positive & negative | relatively difficult |
| Chinese | yes | positive | easy |
| Turkish | yes | positive | easy |

Table 3: Predicted difficulty of the acquisition of bare singulars for kind-reference (mass nouns)

As [Table 3](#) indicates, Arabic learners are predicted to have difficulty in acquiring bare singulars for kind-reference with mass nouns. Arabic requires a definite article with mass nouns for kind-reference. In the English input, Arabic learners would hear both bare singulars and definite singulars with mass nouns, in kind-referring, and definite/specific contexts (e.g., *Could you pass the salt?*) respectively. Thus, they may assume that a definite article may be needed with mass nouns for kind-reference. For that reason, the Arabic learners need both positive evidence (i.e., exposure to exemplars of the language), and negative evidence (i.e. explicit correction that definite singulars cannot be kind-referring for mass nouns) to acquire bare singulars for kind-reference. As for Chinese and Turkish learners, bare singulars are predicted to be relatively easy to acquire since those learners' L1s make use of bare singulars for kind-reference.

As to question (11b), relative to the role of L2 proficiency: In cases where the L1 does not have the same NP form for kind-reference as the target language (see [Tables 2](#) and [3](#)), high proficiency learners may perform significantly better than low proficiency learners. The rationale for this is that in such cases, while L1 transfer may initially lead to incorrect results, with more evidence, learners should acquire the correct morphosyntax. For example, in definite singulars, L2 proficiency may not lead to a statistically significant difference between the low and the high proficiency Arabic group, since Arabic makes use of definite singulars for kind-reference and the participants may simply transfer that from their L1. Nevertheless, for Chinese and Turkish learners, whose L1s lack a definite article, high proficiency learners should perform significantly better than low proficiency learners.

In bare plurals, L2 proficiency may give high-proficiency Arabic and Chinese learners an advantage over low-proficiency learners as both languages lack bare plurals for kind-reference. Low proficiency learners may initially use incorrect morphosyntax, but more input in the L2 may guide the high proficiency learners in the right direction. For Turkish learners, whose L1 licenses bare plurals for kind-reference, L2 proficiency may not create a significant difference.

In bare singulars for mass nouns, L2 proficiency is expected to give high proficiency Arabic learners an advantage, as Arabic does not license bare singulars for kind-reference. However, for Chinese and Turkish learners, L2 proficiency may not create a significant difference between the low and high proficiency groups, as those L1s already license bare singulars for kind-reference with mass nouns.

And thirdly, as to question (11c), relative to the syntactic position of the NP: Based on [Carlson and Pelletier \(1995\)](#), according to whom bare plurals in the object position are more likely to have an existential/indefinite interpretation than a kind interpretation, it is predicted that L2 learners will be more likely to produce bare plurals and rate them as more acceptable in the subject position compared to the object position. Moreover, Turkish learners may produce bare plurals more and rate them as more acceptable in both the subject and the object positions (compared to Arabic and Chinese learners) as bare plurals are kind-referring in Turkish, unlike in Arabic and in Chinese. As for definite singulars, L2 learners are predicted to produce more and give higher acceptability ratings to those NPs in the subject condition compared to the object condition, due to the salience of definite singulars for

kind-reference in the subject position. As definite singulars are kind-referring in Arabic, Arabic learners may outperform Turkish and Chinese learners on both syntactic conditions.

4.1 Instruments

Participants completed a background questionnaire, an L2 proficiency cloze test, an article choice test, a Fill in the Gaps Task (FGT), and an Acceptability Judgment Task (AJT).⁶

4.1.1 Fill-in-the-gaps task (FGT)

The first experimental task was an untimed Fill in the Gaps Task (FGT) with 48 items (see Appendix A). For each item, participants saw a background sentence, followed by an incomplete sentence and a picture. They were asked to complete the sentences with the clue from the picture. Table 4 shows the nature of the items in the FGT.

| Subject | | Object | |
|--|--|---|--|
| Count | Mass | Count | Mass |
| Inherently kind Verb (e.g., die out) | Inherently kind Adjective (e.g., scarce) | Inherently kind Verb (e.g., exterminate) | Kind-compatible Verb _s (e.g., prefer) |
| Inherently kind Adjective (e.g., widespread) | | Kind-compatible Verb _s (e.g., love) | |
| Kind-compatible Verb _e (e.g., eat) | | Kind-compatible Verb _e (e.g., hunt) | |

Table 4: A breakdown of the items in the FGT

There were four items per condition, with a total of 32 experimental items. The items of interest were (a) the subject/count condition with *inherently kind* verbs⁷ and adjectives, (b) the subject/mass condition with *inherently kind* adjectives, and (c) the object/count condition with *inherently kind* verbs. The object/mass

⁶The L2 proficiency cloze test was adopted from Brown (1980), and consisted of a reading passage with 50 blanks, where every 7th word was left blank. Brown’s (1980) cloze test is a useful test of L2 proficiency, the validity of which has been confirmed in a meta-analysis, where Watanabe and Koyama (2008) analyzed 38 cloze tests and concluded that it had a reliability score of 0.90.

⁷An *inherently kind* verb describes a property directly of a kind without exceptions (e.g., An asteroid *exterminated* dinosaurs). An *inherently kind* adjective also delineates a property of a kind (e.g., Gold is *expensive*). *Kind-compatible* verbs state a generalization about individuals in the kind although the predicate does not directly describe a property of the

condition with *kind-compatible* verbs was added to balance the number of mass nouns, but that condition was not included in the statistical analysis. Finally, 16 fillers only compatible with an indefinite singular with an existential interpretation were added. Figure 1 shows a sample item.



Due to the change in climate and excessive hunting, ____ may become extinct soon.

Figure 1: A sample item from the FGT⁸

In creating the stimuli items for both the FGT and the AJT, the names of an animal kind were used for the count noun conditions. Given the observation by Stringer (*in press*) that definite singular kind-reference is not possible with more general categories, I restricted the kinds to the folk-specific level to make sure that they were all compatible with a definite singular for kind-reference. According to Stringer (*in press*), a folk-specific kind is a well-established kind (e.g., the red fox) that is licensed with a definite singular. The use of folk-specific kinds was also crucial in creating items that did not lend themselves to definite plurals. Note that in English, kind-reference can be established with a definite plural such as *The foxes are common in Canada* if the intention is to refer to different kinds of foxes within the fox taxonomy. That is, if one is referring to the fact that red foxes and Arctic foxes are common in Canada, an utterance such as *The foxes are common in Canada* can indeed be licensed and have kind-reference. However, a statement such as *The Arctic foxes are common in Canada* cannot refer to a kind, since one cannot further classify the Arctic fox into separate sub-kinds. With this in mind, only kind names that could not be further classified into sub-kinds were included.

4.1.2 Acceptability judgement task (AJT)

An AJT was employed. For each item, participants saw a short sentence with 5 continuations. The first NP was a bare singular (BS), followed by an indefinite singular (IS), a definite singular (DS), a bare plural (BP), and a definite plural

kind (e.g., Cats *meow*). V_e stands for an eventive verb (e.g., *hunt*) while V_s stands for a stative verb (e.g., *know*).

⁸Note that all the items in the FGT provided the participants with a picture that included the name of the animal species or the mass noun under investigation. This was done to elicit the correct names of the specific animal types or the mass noun that were being elicited. The nouns that appeared with the pictures were always bare singulars.

(DP).⁹ The breakdown of the items was the same as the one in the FGT (see Table 4). Participants were asked to rate the acceptability of each continuation in the context of the preceding sentence on a four-point Likert scale (see Appendix B for the complete items). Each condition was tested with eight items, for a total of 64 items. The items of interest were the same as the ones in the FGT. Table 5 provides a sample item.

| Owing to a decrease in prey base, and hunting, | Completely impossible | Impossible | Possible | Perfectly possible |
|--|-----------------------|------------|----------|--------------------|
| snow leopard is dying out. | | | | |
| a snow leopard is dying out. | | | | |
| the snow leopard is dying out. | | | | |
| snow leopards are dying out. | | | | |
| the snow leopards are dying out. | | | | |

Table 5: A sample item from the AJT

4.2 Procedure

The participants completed all the tasks through Qualtrics, an online platform to collect data. The order of the four tasks and the items within the tasks were randomized with the exception of the L2 proficiency test. The study was completed in one session. It took 80 minutes for the L2 learners, and 45 minutes for the native speakers.

4.3 Participants

The L2 learners were recruited from a large Midwestern university, where they were in an intensive English program, with 15 hours of instruction in English per week. Seventy-one L2 learners of English with Arabic (20), Chinese (25), and Turkish (26) L1 backgrounds completed the study. Twelve participants were excluded: five Arabic, three Chinese, and four Turkish participants.¹⁰ Specifically, participants scoring lower than 10 out of 50 in the L2 proficiency cloze test were excluded, as were participants who scored lower than 8 out of 12 in the article choice test (ACT), adopted from Ionin (2003). The subsequent analysis reports the results from 59 L2 learners, divided into two proficiency levels, taking into consideration the mean and median

⁹The names of count kinds used in both experimental tasks were *Siberian tiger*, *cheetah*, *raccoon*, *cockroach*, *polar bear*, *Arctic fox*, *husky*, *blue whale*, *red fox*, *American alligator*, *giraffe*, *flamingo*, *giant panda*, *killer whale*, *peacock*, and *king cobra*. The names of mass kinds used in both tasks were *ketchup*, *yogurt*, *honey*, *olive oil*, *tea*, *coffee*, *butter*, and *ice cream*. I avoided mass nouns such as wine, beer, or cheese that could naturally be used with plural marking to refer to different types of those substances.

¹⁰A reviewer points out that excluding participants because they lack understanding of articles even though they reach the target proficiency level is problematic. An analysis of the raw scores indicated that out of 12 participants excluded from the study, four were excluded due to their scores in the ACT. However, those four also scored lower than 10 in the L2 proficiency cloze test, providing justification for their exclusion.

scores from the cloze test. Out of 50 points, the mean was 30.93 and the median was 32. As no participant scored 31 in the cloze test, 31 was used as the dividing line between the high and the low proficiency groups. There were 15 Arabic (nine low proficiency, six high proficiency), 22 Chinese (nine low proficiency, 13 high proficiency), and 22 Turkish (11 low proficiency, 11 high proficiency) participants.¹¹ Twenty-four NSs, with an average age of 31.5, and an average ACT score of 11.91 participated in the study. Table 6 provides descriptive statistics from the L2 learners.

| | Low mean (range) | High mean (range) |
|---|---------------------|----------------------|
| Age | 25.72 (18–29) | 26.2 (19–31) |
| Time in the US (in months) | 15.62 (11–19) | 31.66 (24–37) |
| Age of onset | 12.79 (9.33–14.42) | 8.36 (6.71–10.42) |
| Time in other English-speaking countries (in months) | 7.13 (5.38–9.13) | 17.17 (14.17–21.31) |
| L2 proficiency cloze test | 21.68 (16–24) | 39.86 (33–48) |
| Article choice test | 10.68 (9–12) | 11.56 (10–12) |

Table 6: Descriptive statistics from the low and high L2 proficiency groups

5. RESULTS

For each experimental condition, a separate generalized linear mixed effects model was run in R, using the *lmer4* function. The fixed effects included L1, proficiency level (henceforth level), and NP type. Interaction effects included level*NP type. The random effects were the participants and the items. The responses of the NSs were compared to the L2 groups, and the responses of the low and the high proficiency L2 groups were compared to each other. Significant interactions were followed up with post-hoc comparisons. These pairwise comparisons were conducted using the *emmeans* function in R using Tukey for adjustments for multiple comparisons.

5.1 Results from the Fill in the gaps task (FGT)

The first experimental task was a Fill in the gaps task (FGT). This section presents the results from the subject/count condition with inherently kind verb and adjectives, subject/mass condition with inherently kind adjectives, and object/count condition with inherently kind verbs.

¹¹Within the Intensive English Program where the students were studying, there were seven levels of proficiency, from level 1 (absolute beginner) to level 7 (advanced). To pass each level, students had to pass four to five English courses and receive a certain cut-off score in an institutional English proficiency exam at the end of each semester. All the low proficiency participants were recruited from levels 4 and 5 (lower-intermediate and intermediate), and all the high proficiency participants were recruited from levels 6 and 7 (upper-intermediate and advanced).

5.1.1 *Subject/count condition with inherently kind verb and adjectives*

The subject/count condition tested whether the participants were able to provide a definite singular or a bare plural for the gaps in sentences with kind-referring NPs. An example item is indicated in (12).

- (12) Due to the change in climate and too much hunting, ____ may become extinct soon.
(picture of a Siberian tiger)

The responses were categorized based on the five NP categories. Table 7 illustrates participants' responses both in terms of actual numbers of suppliance and as mean suppliance in percentages.

| | *Bare singular | | *Indefinite singular | | Definite singular | | Bare plural | | *Definite plural | |
|------------------------|----------------|-------|----------------------|------|-------------------|-------|-------------|-------|------------------|------|
| | # | % | # | % | # | % | # | % | # | % |
| Arabic low | 24 | 33.33 | 6 | 8.33 | 20 | 27.77 | 22 | 30.55 | 0 | 0 |
| Arabic high | 8 | 16.66 | 1 | 2.08 | 12 | 25 | 27 | 56.25 | 0 | 0 |
| Chinese low | 18 | 25 | 0 | 0 | 13 | 18.05 | 41 | 56.94 | 0 | 0 |
| Chinese high | 31 | 29.8 | 0 | 0 | 13 | 12.5 | 59 | 56.73 | 1 | 0.96 |
| Turkish low | 11 | 12.5 | 4 | 4.54 | 3 | 3.4 | 70 | 79.54 | 0 | 0 |
| Turkish high | 7 | 7.95 | 0 | 0 | 24 | 27.27 | 51 | 57.95 | 6 | 6.81 |
| Native speakers | 1 | 0.52 | 0 | 0 | 89 | 46.35 | 102 | 53.12 | 0 | 0 |

Table 7: Suppliance of NP forms in the subject/count condition in the FGT. (The asterisks indicate ungrammatical responses).

The results from the generalized linear mixed effects model indicate a main effect of NP type ($p < .001$), and interaction effects of level*NP type ($p < 0.002$). Within-group comparisons for each NP type show that the native speakers produced both definite singulars and bare plurals at similar percentages, and the difference between those two was not significant ($p < 0.072$). Low proficiency Arabic speakers mostly produced bare singulars, definite singulars, and bare plurals. The difference between definite singulars and bare plurals was not significant ($p < 0.078$). They produced ungrammatical bare singulars significantly more than definite singulars ($p < 0.002$). High proficiency Arabic learners produced bare plurals significantly more than any other NP type ($p < 0.001$), and definite singulars significantly more than bare singulars ($p < 0.001$). Low proficiency Chinese learners produced bare plurals significantly more than any other NP type ($p < 0.001$), and bare singulars significantly more than definite singulars ($p < 0.003$). Similarly, high proficiency Chinese learners produced bare plurals significantly more than any other NP type ($p < 0.001$), and definite singulars significantly more than bare singulars ($p < 0.002$). Low proficiency Turkish learners produced bare plurals significantly more than any other NP type ($p < 0.001$), and bare singulars significantly more than definite singulars ($p < 0.002$). Similarly, high proficiency Turkish learners produced

bare plurals significantly more than any other NP type ($p < 0.001$), and bare singulars significantly more than definite singulars ($p < 0.002$).

In terms of level*NP type interaction, low proficiency Arabic learners produced significantly more bare singulars ($p < 0.002$), and significantly fewer bare plurals than the high proficiency group ($p < 0.003$). L2 proficiency did not create statistically significant differences between the low and high proficiency Chinese groups in any of the NP types. Low proficiency Turkish learners produced significantly more bare plurals ($p < 0.007$), and significantly fewer definite singulars ($p < 0.004$) than the high proficiency group.

The level*NP type interaction also revealed significant differences between the high proficiency learners and the NSs. First, the NSs produced significantly fewer bare singulars compared to all three high proficiency L2 learners ($p < 0.003$ for all comparisons). Moreover, the NSs produced significantly more definite singulars compared to all three high proficiency groups ($p < 0.001$ for all three comparisons).

5.1.2 Subject/mass condition with inherently kind adjectives

The subject/mass condition tested whether participants were able to provide a bare singular with mass nouns for kind-reference. An example is provided in (13). Table 8 shows participants' responses both in terms of actual numbers of suppliance and as mean suppliance in percentages.

- (13) Being a sweet food substance produced by bees, ____ can be quite scarce in most African countries. (picture of honey)

| | Bare singular | | *Indefinite singular | | *Definite singular | | *Bare plural | | *Definite plural | |
|------------------------|---------------|-------|----------------------|---|--------------------|-------|--------------|------|------------------|---|
| | # | % | # | % | # | % | # | % | # | % |
| Arabic low | 31 | 86.11 | 0 | 0 | 5 | 13.88 | 0 | 0 | 0 | 0 |
| Arabic high | 22 | 91.66 | 0 | 0 | 1 | 4.16 | 1 | 4.16 | 0 | 0 |
| Chinese low | 33 | 91.66 | 0 | 0 | 0 | 0 | 3 | 8.33 | 0 | 0 |
| Chinese high | 48 | 92.3 | 0 | 0 | 1 | 1.92 | 3 | 5.76 | 0 | 0 |
| Turkish low | 40 | 90.9 | 0 | 0 | 1 | 2.27 | 3 | 6.81 | 0 | 0 |
| Turkish high | 41 | 93.18 | 0 | 0 | 2 | 4.54 | 1 | 2.27 | 0 | 0 |
| Native speakers | 90 | 93.75 | 0 | 0 | 0 | 0 | 6 | 6.25 | 0 | 0 |

Table 8: Suppliance of NP forms in the subject/mass condition in the FGT. (The asterisks indicate ungrammatical responses).

The generalized linear mixed effects model indicated a main effect of NP type but not a level*NP type interaction for this condition. Within-group comparisons for each NP type showed that the NSs produced bare singulars significantly more than all the other NP types ($p < 0.001$). Similarly, all L2 groups, irrespective of L1 and their L2 proficiency, produced significantly more bare singulars than any other NP type ($p < 0.002$ for all comparisons).

5.1.3 Object/count condition with inherently kind verbs

The object/count condition tested whether the participants were able to provide a definite singular or a bare plural with object count nouns for kind-reference. An example is given in (14).

- (14) A deadly virus, which has negatively affected other reptiles, may wipe out ____ in Thailand. (picture of a king cobra)

To probe into the question of subject/object asymmetry, the subject/count and the object/count conditions were compared for the target-convergent forms (i.e., definite singulars, and bare plurals) for both the native speakers and the L2 learners. [Table 9](#) provides a comparison of the suppliance of definite singulars and bare plurals in the subject/count and object/count conditions in the FGT, both in terms of actual numbers of suppliance and as mean suppliance in percentages.

| | Subject condition | | | | Object condition | | | |
|------------------------|-------------------|-------|-------------|-------|-------------------|-------|-------------|-------|
| | Definite singular | | Bare plural | | Definite singular | | Bare plural | |
| | # | % | # | % | # | % | # | % |
| Arabic low | 20 | 27.77 | 22 | 30.55 | 7 | 19.44 | 17 | 47.22 |
| Arabic high | 12 | 25 | 27 | 56.25 | 2 | 8.33 | 17 | 70.83 |
| Chinese low | 13 | 18.05 | 41 | 56.94 | 2 | 5.55 | 25 | 69.44 |
| Chinese high | 13 | 12.5 | 59 | 56.73 | 6 | 11.53 | 36 | 69.23 |
| Turkish low | 3 | 3.4 | 70 | 79.54 | 1 | 2.27 | 32 | 72.72 |
| Turkish high | 24 | 27.27 | 51 | 57.95 | 9 | 20.45 | 29 | 65.9 |
| Native speakers | 89 | 46.35 | 102 | 53.12 | 35 | 36.45 | 59 | 61.45 |

Table 9: Suppliance of definite singulars and bare plurals in the subject/count and object/count conditions in the FGT¹²

First of all, the NSs produced significantly fewer definite singulars in the object/count condition compared to the subject/count condition ($p < 0.002$). Moreover, the NSs produced significantly more bare plurals in the object/count condition compared to the subject/count condition ($p < 0.001$). The results from both the low and high

¹²A reviewer questions the suppliance rates by the NSs and asks whether the rates indicate the preferences of the NSs or if the contexts somehow led them to use one NP form over the other. The contexts in the FGT task were created in a way to license both definite singulars and bare plurals for kind-reference in the count noun conditions. In the subject/count condition with inherently kind verb and adjectives, the NSs produced both definite singulars and bare plurals for kind-reference at similar percentages, and there was no statistically significant difference between the two NP types ($p < 0.072$). However, in the object/count condition with inherently kind verbs, the NSs produced bare plurals significantly more than definite singulars ($p < 0.031$). Thus, the NSs had a preference for bare plurals for kind-reference with count nouns in the object position.

proficiency Arabic participants mirrored those of NSs. Both groups produced significantly fewer definite singulars in the object/count condition than the subject/count condition ($p < 0.003$ for both comparisons), while producing significantly more bare plurals in the object/count condition than the subject/count condition ($p < 0.001$ for both comparisons). The low proficiency Chinese learners performed similarly to the Arabic groups, producing significantly fewer definite singulars in the object/count condition than the subject/count condition ($p < 0.002$), and significantly more bare plurals in the object/count condition than the subject/count condition ($p < 0.002$). High proficiency Chinese learners produced significantly more bare plurals in the object/count condition than the subject/count condition ($p < 0.002$), but for the definite singulars, there was no statistically significant difference. The results from the low proficiency Turkish learners mirrored those of high proficiency Chinese learners. They produced more bare plurals in the object/count condition than the subject/count condition ($p < 0.0035$), but for definite singulars, there was no statistically significant difference. Finally, the high proficiency Turkish learners produced significantly fewer definite singulars in the object/count condition than the subject/count condition ($p < 0.0037$), and significantly more bare plurals in the object/count condition than the subject/count condition ($p < 0.0034$).

5.2 Results from the Acceptability Judgement Task (AJT)

The second experimental task was an untimed AJT, testing how acceptable participants think the five NP forms were, following a short context. Participants rated the sentences on a Likert scale from 1 to 4 (1: completely impossible; 2 impossible; 3 possible; 4 perfectly possible). For each experimental condition, a separate generalized linear mixed effects model was run in R based on participants' mean ratings for each NP type. The responses of the NSs were compared to the L2 groups, and the responses of the low and the high proficiency L2 groups were compared to each other. Significant interactions were followed up with post-hoc comparisons.

5.2.1 *Subject/count condition with inherently kind verb and adjectives*

The target forms in the subject/count condition were the definite singular and a bare plural. An example is provided in (15), followed by Table 10 showing participants' ratings in averages for NP types.

- (15) Native to the Arctic regions of the Northern Hemisphere, Arctic fox/an Arctic fox/the Arctic fox/Arctic foxes/the Arctic foxes is/are gradually dying out.¹³

The results from the generalized linear mixed effects model indicated a main effect of level ($p < 0.001$), and NP type ($p < .001$). There were also significant interaction effects of level*NP type ($p < .001$). Within-group comparisons for each NP type showed that the NSs gave similar acceptability ratings to definite singulars and bare plurals, with no significant difference ($p < 0.065$). Low proficiency Arabic learners gave the highest acceptability ratings to definite plurals, a non-

¹³In the actual test, which is available upon request, the five different sentences were presented in separate lines.

| | *Bare singular | *Indefinite singular | Definite singular | Bare plural | *Definite plural |
|------------------------|----------------|----------------------|-------------------|-------------|------------------|
| Arabic low | 2.3 | 2.05 | 2.9 | 2.93 | 3.16 |
| Arabic high | 2.11 | 2.25 | 3.47 | 3.87 | 3.48 |
| Chinese low | 2.41 | 1.61 | 2.88 | 3.25 | 2.54 |
| Chinese high | 2.67 | 1.41 | 2.97 | 3.88 | 2.79 |
| Turkish low | 1.86 | 1.94 | 2.25 | 3.41 | 2.37 |
| Turkish high | 1.86 | 1.25 | 2.92 | 3.89 | 2.45 |
| Native speakers | 1.19 | 1.1 | 3.85 | 3.98 | 2.28 |

Table 10: Mean ratings in the subject/count condition in the AJT. (The asterisks indicate ungrammatical responses).

target form in English. They rated definite plurals significantly higher than grammatical bare plurals ($p < 0.003$) and definite singulars ($p < 0.003$). There was no statistically significant difference between bare plurals and definite singulars. Bare singulars and indefinite singulars received significantly lower ratings compared to all other NPs ($p < 0.001$ for all comparisons). The high proficiency Arabic group rated bare plurals significantly higher than definite singulars ($p < 0.002$) and definite plurals ($p < 0.001$). However, there was no statistically significant difference between definite singulars and definite plurals. Bare singulars and indefinite singulars received significantly lower ratings than other NPs ($p < 0.001$ for all comparisons). Low proficiency Chinese learners rated bare plurals significantly higher than definite singulars ($p < 0.003$) and definite plurals ($p < 0.002$). They also rated definite singulars significantly higher than definite plurals ($p < 0.003$). They rated bare singulars and indefinite singulars significantly lower than all other NPs ($p < 0.001$ for all comparisons). Still, they rated bare singulars significantly higher than indefinite singulars ($p < 0.002$). High proficiency Chinese participants rated bare plurals significantly higher than other NPs ($p < 0.001$ for all comparisons). Indefinite singulars received significantly lower ratings than bare singulars, definite singulars, and definite plurals ($p < 0.001$ for all comparisons). Low proficiency Turkish participants rated bare plurals significantly higher than other NPs ($p < 0.001$ for all comparisons). There was no statistically significant difference between definite singulars and definite plurals ($p < 0.065$); both were rated significantly higher than bare singulars and indefinite singulars ($p < 0.002$ for both comparisons). High proficiency Turkish learners rated bare plurals significantly higher than other NPs ($p < 0.001$ for all comparisons). Definite singulars were rated significantly higher than definite plurals ($p < 0.002$), bare singulars ($p < 0.002$), and indefinite singulars ($p < 0.002$). Finally, they rated bare singulars significantly higher than indefinite singulars ($p < 0.001$).

In terms of level*NP type ($p < .001$) interaction, the low proficiency Arabic group rated definite singulars ($p < 0.002$) and bare plurals ($p < 0.001$) lower than

the high proficiency group. The low proficiency Chinese group rated bare plurals lower than the high proficiency group ($p < 0.002$). Low proficiency Turkish learners rated indefinite singulars higher ($p < 0.023$), but definite singulars ($p < 0.002$) and bare plurals ($p < 0.002$) lower than the high proficiency group.

The level*NP type interaction also indicated significant differences between high proficiency learners and NSs. Although all the high proficiency L2 groups were native-like on bare plurals, the NSs gave significantly higher acceptability ratings to definite singulars compared to the high proficiency Chinese ($p < 0.001$) and high proficiency Turkish groups ($p < 0.001$). Compared to NSs, the high proficiency Arabic group gave indefinite singulars and definite plurals significantly higher ratings ($p < 0.001$ for both comparisons). Finally, high proficiency Arabic, Chinese, and Turkish learners gave significantly higher acceptability ratings to bare singulars compared to the NSs ($p < 0.002$, $p < 0.001$, $p < 0.003$ respectively).

5.2.2 *Subject/mass condition with inherently kind adjectives*

The target form in the subject/mass condition was a bare singular. An example is provided in (16). Table 11 illustrates average ratings for each NP type.

- (16) Despite health benefits such as treating wounds, healing skin conditions, and boosting energy, honey/a honey/the honey/honeys/the honeys is/are rare in the US.

| | Bare singular | *Indefinite singular | *Definite singular | *Bare plural | *Definite plural |
|------------------------|---------------|----------------------|--------------------|--------------|------------------|
| Arabic low | 3.18 | 1.87 | 2.7 | 1.88 | 1.93 |
| Arabic high | 3.83 | 1.68 | 2.66 | 2.27 | 2.04 |
| Chinese low | 3.5 | 1.26 | 2.41 | 1.86 | 1.52 |
| Chinese high | 3.9 | 1.21 | 2.62 | 1.75 | 1.32 |
| Turkish low | 3.21 | 1.73 | 2.34 | 1.72 | 1.68 |
| Turkish high | 3.96 | 1.03 | 2.19 | 1.06 | 1.01 |
| Native speakers | 3.98 | 1.18 | 1.19 | 2.05 | 1.21 |

Table 11: Mean ratings in the subject/mass condition in the AJT. (The asterisks indicate ungrammatical responses).

The results from the generalized linear mixed effects model indicated a main effect of level ($p < 0.001$), and NP type ($p < 0.001$). There were also significant interaction effects of level*NP type ($p < 0.001$). Within-group comparisons for each NP type demonstrated that the NSs rated bare singulars significantly higher than any other NP type ($p < 0.001$ for all comparisons). The NSs rated bare plurals significantly higher than indefinite singulars, definite singulars, and definite plurals

($p < 0.002$ for all comparisons).¹⁴ Among L2 learners of English, there was a consistent pattern irrespective of the L1 or L2 proficiency. All the participants rated bare singulars significantly higher than any other NP type ($p < 0.001$ for all comparisons). They also rated definite singulars significantly higher than indefinite singulars, bare plurals, and definite plurals ($p < 0.002$ for all comparisons). The high proficiency Arabic learners, and the low and the high proficiency Chinese groups rated bare plurals significantly higher than indefinite singulars and definite plurals ($p < 0.002$ for all comparisons).

In level*NP type interaction, the low proficiency Arabic group rated bare singulars significantly lower than the high proficiency group ($p < 0.022$). The low proficiency Chinese group rated bare singulars lower ($p < 0.034$) than the high proficiency group. The low proficiency Turkish group rated bare singulars lower ($p < 0.001$), but indefinite singulars ($p < 0.001$), bare plurals ($p < 0.002$), and definite plurals ($p < 0.002$) higher than the high proficiency group.

The level*NP type interaction also revealed significant differences between the high proficiency learners and the NSs. The high proficiency Arabic group gave higher acceptability ratings to indefinite singulars ($p < 0.003$), definite singulars ($p < 0.001$), and definite plurals ($p < 0.002$) compared to the NSs. The high proficiency Chinese group gave higher acceptability ratings to definite singulars ($p < 0.002$) compared to the NSs. Finally, the high proficiency Turkish group gave significantly higher acceptability ratings to definite singulars ($p < 0.002$), but significantly lower ratings to bare plurals ($p < 0.002$) than the NSs.

5.2.3 *Object/count condition with inherently kind verbs*

The target forms in the object/count condition were definite singular and bare plurals. An example is provided in (17).

- (17) Climate change is impacting the population of many Arctic creatures. The changes may particularly eradicate polar bear/a polar bear/the polar bear/polar bears/the polar bears.

To investigate the question of subject/object asymmetry, the subject/count and the object/count conditions were compared for the target-convergent forms for the NSs and the L2 learners. Table 12 provides a comparison of the ratings of definite singulars and bare plurals in the subject/count and object/count conditions in the AJT.

NSs rated definite singulars significantly higher in the subject/count condition compared to the object/count condition. For all L2 groups, there was no statistically significant difference between the ratings of definite singulars and bare plurals in the subject/count and the object/count conditions.

¹⁴NSs may have conceptualized bare plurals in a coerced way due to the plural marking. This is in line with what Jackendoff (1991) refers to as the universal packager. Jackendoff (1991) argues that mass nouns can be interpreted as denoting individuals rather than substances when used with numerals or plural marking (e.g., *honeys*, *olive oils*, referring to different kinds of those substances).

| | Subject condition | | Object condition | |
|------------------------|-------------------|-------------|-------------------|-------------|
| | Definite singular | Bare plural | Definite singular | Bare plural |
| Arabic low | 2.9 | 2.93 | 2.83 | 2.94 |
| Arabic high | 3.47 | 3.87 | 3.35 | 3.81 |
| Chinese low | 2.88 | 3.25 | 3.01 | 3.26 |
| Chinese high | 2.97 | 3.88 | 2.89 | 3.7 |
| Turkish low | 2.25 | 3.41 | 2.27 | 3.39 |
| Turkish high | 2.92 | 3.89 | 2.9 | 3.87 |
| Native speakers | 3.85 | 3.98 | 3.69 | 3.87 |

Table 12: Mean ratings of definite singulars and bare plurals in the subject/count and object/count conditions in the AJT

6. DISCUSSION

I provide below a discussion of the results in light of the research questions.

6.1. L1 transfer in the acquisition of kind-reference in L2 English

Results confirmed the findings of previous research (Snape et al. 2009, 2013; Ionin et al. 2013, Ionin et al. 2014; Hermas 2020a, b, c) in that L1 transfer was evident in the acquisition of kind-reference in L2 English. In the subject/count and object/count conditions in the FGT, the participants produced NP forms used for kind-reference in their L1 in L2 English. They also gave higher acceptability ratings to those NPs that were used for kind-reference in their L1. Recall that kind-reference is established with a definite singular or a definite plural with count nouns, and definite singulars with mass nouns in Arabic. In Chinese, kind-reference is expressed using a bare singular irrespective of whether the noun is count or mass. In Turkish, kind-reference is conveyed using a bare singular or a bare plural with count nouns, and using a bare singular with mass nouns. L1 transfer was clear among Arabic learners, who produced definite singulars significantly more than Turkish or Chinese participants, as well as giving them higher acceptability ratings. Moreover, Chinese learners used bare singulars, a non-target-like form, significantly more than Arabic and Turkish learners, and they gave them higher acceptability ratings. Turkish participants produced bare plurals significantly more compared to the other L2 groups, as well as giving them higher acceptability ratings. Finally, in the subject/mass condition in the FGT, Arabic participants produced significantly more definite singulars compared to the other L2 groups, and they rated definite singulars significantly higher.

The results also indicated, in line with previous research (Ionin et al. 2013, Ionin et al. 2014; Hermas 2020a, b, c), that recovery from L1 transfer, particularly at high proficiency levels, was also possible. This was evident in high proficiency Arabic learners' low production and acceptability ratings of definite plurals, and their high production and acceptability ratings of bare plurals in both tasks. Similarly, Chinese learners, particularly at high proficiency levels, produced and gave high acceptability ratings to bare plurals, a form that is not licensed for kind-reference

in Chinese. Recovery from L1 transfer was also apparent among high proficiency Turkish learners' high production and ratings of definite singulars.

I had predicted the difficulty of the acquisition of bare singulars, definite singulars, and bare plurals (see Table 2 and Table 3) based on whether the participants' L1 has the same NP form for kind-reference compared to the target language, and what kind of evidence (i.e., positive or negative) is needed to acquire that form. I argued that it would be challenging for Arabic learners to acquire bare singulars for kind-reference with mass nouns, as such a form is not licensed in Arabic, and as it requires both positive and negative evidence. This prediction was not borne out, since Arabic learners were on a par with NSs in bare singulars. Hence, Arabic learners may acquire bare singulars through exposure to positive input only. Regarding bare plurals, all L2 learner groups were on a par with NSs.

This study confirmed that definite singulars are challenging for L2 learners, as reported in previous research (Ionin et al. 2011; Snape et al. 2009, 2013; Ionin et al. 2014). In particular, low proficiency Chinese and Turkish learners showed persistent transfer of bare singulars from their L1s, which suggests that positive L2 input alone may not be sufficient for the acquisition of definite singulars, and that L2 learners may need negative evidence as well. However, having an L1 background with definite articles improved learners' performance, as Arabic learners performed significantly better than Chinese and Turkish learners.

Citing corpus research from Biber et al. (1999), Snape et al. (2013: 21) indicate that the definite article is used for generic reference "less than 2.5% in conversation, less than 2.5% in fiction, 5% in academia and 5% in the news". Similarly, according to Ionin et al. (2011), L2 learners receive little input that *the* has a taxonomic reading. An analysis of the textbooks used in the English program where the students in the current research were studying showed that the kind-referring *the* appeared very briefly in advanced language coursebooks and it was introduced later in instruction than kind-referring bare plurals. That may account for the participants' difficulties in acquiring the definite article for kind-reference.

An interesting observation that cannot be attributed to L1 transfer was that both in the subject/count and the object/count conditions in the FGT, low proficiency Arabic learners produced bare singulars, which are illicit both in Arabic and in English to express kind-reference. A similar finding has been reported by Ionin et al. (2015). We could postulate that Arabic learners acquired bare plurals, unlike definite plurals, in their L1. However, they incorrectly extended that to singular nouns, using bare singular nouns like bare plural ones. This may be due to a lack of understanding of mass/count distinction in L2 English. Thus, acquiring kind-reference may hinge upon a thorough understanding of mass/count distinction in L2 English.

6.2 The effect of L2 proficiency on the acquisition of kind-reference in L2 English

The current study provided evidence for both facilitative L1 transfer (e.g., Arabic learners' higher production and acceptability ratings of definite singulars; Turkish

learners' higher production and acceptability ratings of bare plurals), and non-facilitative L1 transfer (e.g., Chinese learners' higher production and acceptability ratings of bare singulars). Two patterns were found to occur with an increase in proficiency level: (a) higher production and acceptability ratings of bare plurals and definite singulars in the subject, object/count conditions; and (b) greater consistency in choice of NP forms.

This study demonstrated that in cases where the participants' L1 did not have the same NP form for kind-reference compared to the target language, high proficiency learners usually performed better than low proficiency learners. That is, L2 proficiency had a more pronounced impact on the acquisition of kind-reference where the L1 and the L2 had different morphosyntax to express kind-reference. Although a high L2 proficiency generally correlated with a more native-like production and understanding of kind-reference, which may be attributed to more exposure to kind-referring NPs both inside and outside a classroom setting, such an improvement in learner production and acceptability judgments was not always significant. Assuming that high proficiency learners received more input in the L2, this might explain their slightly better performance than the low proficiency groups.¹⁵ Ionin et al. (2014) argue that it is fundamental to collect more information about the input frequency and quality that L2 learners are exposed to at various proficiency levels. As Ionin et al. (2015) point out, no corpus studies have been carried out to tackle this issue. Future research could proceed in that direction.

This study showed that recovery from non-facilitative L1 transfer was possible at high proficiency levels. The findings are in line with Ionin et al. (2013), who argue that the differences between the L1 and the L2 do not necessarily lead to a permanent obstacle to successful L2 acquisition, and also with Hermas (2020b, c), who concludes that pragmatic properties determining interpretation outcomes are acquirable in a second/third language.

6.3. Subject/object asymmetry in the L2 acquisition of kind-reference in English

Results revealed a subject/object asymmetry in the acquisition of kind-reference. Table 13 shows this asymmetry.

Results indicated that with the exception of the high proficiency Chinese learners and low proficiency Turkish learners, all the L2 groups and the NSs produced significantly more definite singulars in the subject/count condition in the FGT. Both NSs and the L2 learners may have been exposed to more occurrences of definite singulars in the subject position. Future research could utilize a corpus study or a textbook analysis, such as the one by Azaz (2019), to investigate the salience of definite singulars for kind-reference in the subject position.

¹⁵The background questionnaire demonstrates that this is indeed plausible, as the high proficiency learners spent significantly more time in English-speaking countries, and started their English education much earlier than their peers in the low proficiency groups.

| | FGT | | AJT | |
|--|---|-------------|---|-------------|
| | Definite singular | Bare plural | Definite singular | Bare plural |
| Arabic low & high Chinese low Turkish high | Produced significantly more in the subject condition | | No significance between the subject and object conditions | |
| Chinese high Turkish low | No significance between the subject and object conditions | | Produced significantly more in the object condition | |
| Native speakers | Produced significantly more in the subject condition | | Rated significantly higher in the subject condition | |

Table 13: Subject/object asymmetry in L2 acquisition of definite singulars and bare plurals

Both the NSs and the L2 learners produced significantly more bare plurals in the object condition, which is unexpected given Carlson and Pelletier (1995), who argue that bare plurals in object position are likely to have an existential interpretation rather than a generic one. NSs and the L2 learners may have interpreted bare plurals as existential even though the contexts were created to force a kind-referring interpretation.

In the AJT, the NSs rated definite singulars significantly higher in the subject condition, which may be due to a higher exposure to definite singulars in the subject position. Overall, this study has contributed to previous research in revealing that definite singulars for kind-reference are more challenging to acquire for L2 learners, particularly in the object position.

6.4 Definite plurals for kind-reference

One further observation is that although definite plurals were not produced by the NSs or the L2 learners in the FGT, they both gave higher acceptability ratings to definite plurals than to bare singulars or indefinite singulars in the AJT. This is interesting because definite plurals cannot be kind-referring in English when the reference is to a taxonomic kind. Compared to bare singulars (which are ungrammatical with count nouns), and indefinite singulars (which are grammatical, but which cannot be used as kind-referring NPs), definite plurals received significantly higher ratings. A hypothesis regarding this comes from Acton (2019), who suggests that resorting to definite plurals to talk about all or typical members of a group depicts that group as a monolith, distinct from the speaker, a function that bare plurals lack. It is possible that the participants had a notion of a familiar animal kind when a bare plural was used, while they had the idea of an unfamiliar animal kind when a definite plural was used.

The findings of this study should be interpreted in light of certain limitations. There was a potentially serious drawback in the methodology in the FGT, where the pictures always showed one animal, described in the singular. This could have not only encouraged incorrect responses for kind-reference (e.g., an Arctic fox) but also discouraged bare plurals (e.g., Arctic foxes). There are two ways to get around this problem. The first is to present more than one animal on each picture. However, such a design may result in the opposite problem, discouraging the use of definite singulars (e.g., the Arctic fox). Moreover, it may encourage bare plurals, and participants may produce those forms more, increasing their success. A better solution would be to present the participants with items where half of the pictures include a single animal, and the other half more than one animal on each picture. Another limitation is due to the lack of a control condition in the FGT. To show that the L2 learners can produce kind-referring expressions with either definite singulars or bare plurals, the FGT could have included singular and plural nouns with indefinite/definite interpretations, to check if the participants had acquired (in)definiteness as a prerequisite to learning kind-reference. Moreover, the subject/mass and the object/count conditions in the FGT were tested with only four items. To increase reliability, each experimental condition could have been tested with at least six items. These limitations should be taken into consideration in future research.

Despite these limitations, this study has two strengths compared to previous research on the L2 acquisition of kind-reference. The first is the carefully selected L2s that instantiate different morphosyntactic forms for expressing kind-reference.¹⁶ This combination of L1s has not been tested in the same study before. The second strength is investigating whether the syntactic position of an NP has any effect on the acquisition of kind-referring expressions. Again, this has rarely been done in previous research.

7. CONCLUSION

This study investigated the acquisition of kind-referring NPs in L2 English by learners with Arabic, Chinese, and Turkish L1 backgrounds. Results showed that the L1 influenced the interlanguage, since learners produced more and gave higher acceptability ratings to NPs that had the same morphosyntax for kind-reference in the L1 and the L2. Another question was whether higher L2 proficiency correlated with higher success in the production and acceptability ratings of kind-reference. Results demonstrated that L2 learners had more target-convergent responses with high L2 proficiency. Results also indicated a subject/object asymmetry in the production of bare plurals and definite singulars for kind-reference in L2 English.

This study contributes to the second language acquisition literature in demonstrating that the acquisition of articles for kind-reference is challenging for Arabic,

¹⁶As an anonymous reviewer pointed out, there could have been another learner group whose L1 works like English to further gauge the extent of facilitative versus negative L1 transfer.

Chinese, and Turkish L2 learners of English, particularly at low levels of L2 proficiency. It has demonstrated that kind-reference is acquired relatively late in L2 English, although L1 positive transfer effects give low proficiency learners an advantage, despite their limited proficiency level.

SUPPLEMENTARY MATERIALS

To view supplementary material for this article, please visit <https://doi.org/10.1017/cnj.2023.22>.

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