Detecting Definiteness: On the L2 Acquisition of the Mandarin Plural Marker *–men*

Jue Wang and Bonnie D. Schwartz

1. Introduction

It is widely documented that the acquisition of functional morphology presents great difficulty to second language (L2) learners. They have been observed to be inconsistent in supplying functional morphemes/words in contexts where they are obligatory. However, as this inconsistency comes from L2 production data, the conclusions that can be drawn about the underlying Interlanguage grammar remain unclear. According to the Missing (Surface) Inflection Hypothesis (e.g., Haznedar & Schwartz, 1997; Lardiere, 1998; Prévost & White, 2000), the absence of surface manifestations of functional morphology in production does not necessarily suggest a lack of associated abstract functional features in the grammar. Thus, L2 studies of functional morphology should pay attention not only to whether a functional morpheme/word is produced, but also to how it is understood.

Our goal in this study is to advance our understanding of the Interlanguage grammar with regard to functional morphology, by examining whether L2 learners (L2ers) of Mandarin can come to be sensitive to the definiteness constraint on the Mandarin plural marker *–men*. The paper is organized as follows. In Section 2, we review the Feature Reassembly Hypothesis (Lardiere, 2009, 2017), the framework adopted in the current research. Section 3 introduces the properties of Mandarin plural marker *–men* and the learnability problem for L2ers whose native language (L1) is English. Following a brief review of previous L2 studies on the definiteness feature of *–men* in Section 4, we report the present study in Section 5. We conclude with a general discussion.

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2. Feature Reassembly Hypothesis (FRH)

We start with an overview of the process involved in the L2 acquisition of functional morphology. We focus on the main tenets of the Feature Reassembly Hypothesis (FRH; Lardiere, 2009, 2017).

FRH assumes that all morphosyntactic differences across languages as well as their interpretative consequences are the products of formal features. Although Universal Grammar (UG) makes available the entire feature inventory, the way in which features are selected and assembled into specific morpholexical items varies from language to language. Following Full Transfer (e.g., Schwartz & Sprouse, 1996), L2ers bring to the learning task a fully-developed grammatical system, and this includes the exact ways the selected features are combined into the L1 morpholexical items. This is hypothesized to constitute the initial state of L2 development.

In learning a new morpholexical item in the target language (TL), FRH proposes that L2ers first (subconsciously) try to determine whether there is an ostensibly analogous element in their L1; and if so, they impose the feature(s) of the L1 element onto the corresponding TL element (see also Sprouse, 2006). Since the feature matrix of the L1 morpholexical item could turn out to be different from the actual feature matrix of the perceived analogous TL element, feature reconfiguration of that element might be required.

In addition to acquiring the features of morpholexical items, L2ers also need to determine "the possible conditioning environments for the expression of those features" (Lardiere, 2009, p. 209), which comprise obligatory, prohibited, or optional environments. The notion of conditioning environment is important, as it is often the case that when L2ers are tested on their knowledge of functional morphology, they are simultaneously tested on three things all at once: forms, features and conditioning environments. When L2ers do not perform in a target-like manner, any of these three could be the source of the problem, and thus it should be the task of L2 researchers to identify precisely in what way(s) the knowledge underlying L2ers' behavior differs from that of native speakers.

When it comes to learning outcomes, FRH does not take a position on whether target-like feature reassembly is guaranteed. Lardiere (2009) notes that the extent to which feature reassembly is successful hinges on the extent to which L2ers are able to detect morphosyntactic feature contrasts. In other words, the learnability of a new feature in TL morpholexical items is dependent on its detectability. And the detectability of a feature is to a large extent determined by its associated conditioning environments. If L2ers are not sensitive to the conditioning environments, it would be extremely difficult (if not impossible) for them to identify the feature(s) appropriate to the TL grammar. Unlike an obligatory environment which overtly and unambiguously instantiates the feature matrix, it is less straightforward as to what L2ers can make of prohibited and optional environments. The definiteness feature associated with Mandarin plural marker *–men*, to which we turn now, illustrates precisely one such scenario.

3. The Mandarin plural marker *–men* and the issue of learnability

3.1. Plural marking in Mandarin

To start off, it should be noted that there are debates in the theoretical literature on whether Mandarin *–men* is a true plural marker or not (see, e.g., Iljic, 1994; Jiang, 2017; Li, 1999). However, we assume that from a language learner's perspective, as long as a morphological element has the function of overtly marking plurality, it can be perceived as a "plural marker."

Descriptively speaking, Mandarin *–men* can be suffixed on both pronouns and common nouns with human referents. While suffixation on pronouns is obligatory, on common nouns it is optional. That is to say, a *–men*-suffixed nominal can receive only a plural reading, but a bare (unsuffixed) nominal is not necessarily singular. In fact, bare nominals in Mandarin are underspecified for number (Huang, Li & Li, 2009). Another property of *–men* is that a *–men*-suffixed nominal can receive only a definite reading. This is illustrated in (1).

(1) a. Wo qu zhao haizi-*men*.
I go find child-PL[1]
* 'I will go find some children.'
'I will go find the children.'

(Li, 1999, p. 78, (3c))

b. Wo qu zhao haizi.
I go find child
'I will go find a child.'
'I will go find the child.'
'I will go find some children.'
'I will go find the children.'

(Li, 1999, p. 78, (3d))

The referent of *haizi–men* 'child-PL' in (1a) is specified as plural and definite. In (1b), by contrast, the bare nominal *haizi* 'child' does not contain information regarding either the plurality or the definiteness status of its referent.

In summary, *–men* contains three features: [+plural], [+human] and [+definite]. The focus of the present study is on the [+definite] feature. Crucially, if a Mandarin speaker intends to express plurality of a definite human nominal, adding *–men* is an option (albeit not required), but to express plurality of an indefinite human nominal, adding *–men* is not an option.[2] The possible versus

[1] Abbreviations: ASP = aspect marker; CL = classifier; LOC = locative; PL = plural; POSS = possessive.

[2] Mandarin has other forms that can express plurality (quantifiers such as *henduo* 'many') and definiteness (demonstratives such as *zhexie* 'these'). In this study, we consider only the *–men* form and the bare form.

impossible plural forms of definite and indefinite human nominals in Mandarin are summarized in Table 1.

Table 1. Possible vs. impossible plural forms of human definite nominals and human indefinite nominals in Mandarin.

	–men form	bare form
definite	✓	✓
indefinite	✗	✓

3.2. The learnability issue facing L1-English L2ers of Mandarin

Following FRH, L1-English L2ers of Mandarin are hypothesized to initially map Mandarin *–men* onto the feature and conditioning environment of English plural *–s*, since both have the function of marking plurality. Because English plural *–s* has only a [+plural] feature, such L2ers initially specify *–men* as having only the [+plural] feature in their Interlanguage representation.

Upon encountering Mandarin input containing a nominal that does not have *–men* but clearly does have a plural referent, such as with plural inanimates (e.g., *hua* 'flower' referring to more than one flower; *che* 'car' referring to more than one car), the L2ers will come to know that the [+plural] feature as well as its conditioning environment transferred from English does not suffice for *–men*. At this point, there are (at least) two hypotheses they might make. For the first, ***the focus is the features themselves***: The L2ers (subconsciously) set out to look for other features in order to account for the TL input. That is, they know their current feature matrix of *–men* is not sufficient, so they search the input for other grammatical properties that are possibly associated with *–men*.

Alternatively, ***the focus is the conditioning environment(s)***: These L2ers hypothesize that *–men* is optional under all circumstances. The latter hypothesis is arguably the less likely of the two from the L2er's perspective, as this would go against a presumed preference for a bidirectional, one-to-one mapping between form and meaning (e.g., DeKeyser, 2005). In English, for example, the plural suffix *–s* and plurality are in a bidirectional relation: For regular count nouns, whenever there is a plural *–s*, the noun has to be plural, and whenever a noun is plural, there has to be a plural *–s*. If L2ers were to assume at this point in Interlanguage development that *–men* is entirely optional, learning would stop. They would never understand under what circumstances *–men* is possible vs. impossible. Under such a learning scenario, the L2ers would end up allowing *–men* to optionally occur with [–human] plural nominals and with [–definite] plural nominals, in addition to the target [+human], [+definite] plural nominals. Ultimately, then, it is the first hypothesis above that would bring L1-English L2ers of Mandarin closer to the TL grammar.

The next step for such L1-English L2ers of Mandarin, we hypothesize, is to acquire the [+human] and [+definite] features of *–men*. Our focus is on the

[+definite] feature.[3] One thing to bear in mind is that Mandarin is a language without articles; consequently, the definite vs. indefinite status of nominals is typically not overtly expressed. Still, in light of the fact that definiteness ***is*** overtly expressed in their L1 (English), these L2ers may be on the lookout for this property, based primarily on contextual information. In principle, then, this should allow them to learn that *–men* occurs in definite contexts.

Before moving onto contexts that are not definite, we first have to discuss a complicating factor, namely, optionality. If the L2ers identify the importance of definite contexts, they will also come to know that *–men* does not always occur with [+definite] nominals. Here the L2ers face exactly the same issue as before with the [+plural] feature. And again, they can do one of two things. Either they ***seek out other features*** in an attempt to determine when *–men* obligatorily occurs, or they hypothesize that *–men* is ***optional in definite contexts***. Unlike in the first case with the [+plural] feature, this time it is the latter hypothesis involving optionality that in fact characterizes the target grammar.

And finally, as for [–definite] nominals, how could these L2ers come to know when *–men* is impossible? One might think that once they know that *–men* occurs in definite contexts, they automatically infer that *–men* does not occur in indefinite contexts. The wrinkle here is that from the L2er's perspective, there could be cases where an ostensibly indefinite context seems to contain a *–men*-marked nominal. This is because it is not always easy to determine definiteness from the context alone: The way that the L2er understands contexts might well diverge from the speaker's intention. Another possible inference that such L2ers might make, especially in light of the fact of optionality of *–men* in definite contexts, is that *–men* in indefinite contexts is also optional but occurs less frequently for reasons unrelated to the grammatical properties of *–men*.

Ultimately, despite whatever learnability issues there are with the L2 acquisition of *–men* by L1-English speakers, whether they can arrive at the TL grammar—viz., *–men*'s exclusively definite interpretation and its optionality—is an empirical question.

4. Previous L2 research on the acquisition of the [+definite] feature of *–men*

4.1. Prawatmuang (2017)

There have as yet been very few studies on the L2 acquisition of the definite requirement of *–men*. Prawatmuang (2017), to the best of our knowledge, was the first researcher to examine this issue. She used two tasks, an acceptability judgment task (AJT) and an online self-paced reading task, to investigate whether L2ers come to disallow *–men* in existential constructions.

[3] One reason for this decision is that although the requirement of *–men* taking a human referent is taught in the Mandarin language classroom, this is not (ever) the case for the definiteness requirement.

(2) a. Xiaozhang gangcai kanjian you xuesheng zai gongyuan
Principal just see have student at park
li ti-qiu.
LOC kick-ball
'The principal just saw that there was a student playing ball in the park.'
'The principal just saw that there were students playing balls in the park.'
(Prawatmuang, 2017, p. 107, (89))

b. * Xiaozhang gangcai kanjian you xuesheng-*men* zai
Principal just see have student-PL at
gongyuan li ti-qiu.
park LOC kick-ball
(Prawatmuang, 2017, p. 107, (90))

Following the definiteness effect of existential constructions (e.g., Huang, 1987), nominals occurring after an existential marker (e.g., *you* 'have' in Mandarin) must be indefinite. As *–men*-suffixed nominals can only have a definite interpretation, they cannot co-occur with *you*. So (2a) is acceptable and (2b) is not.

Prawatmuang found that native speakers and only two of 21 advanced L1-Thai L2ers of Mandarin showed a contrast between the two conditions, from which she concluded that the acquisition of the definite restriction on *–men* is difficult. Yet, it still remains unknown whether learners whose L1 has a general plural marker (e.g., English plural *–s*) can come to know possible vs. impossible *–men*-suffixation on definite and indefinite nominals more generally.

4.2. Wang (2020)

Prior to the present research, a pilot study was conducted with a group of L1-English L2ers of Mandarin and a group of native Mandarin controls. A contextualized AJT was employed. For each item, participants read an English paragraph and rated a Mandarin sentence on how well it matches the paragraph on a 4-point Likert scale (with an additional 'I don't know' option). The experiment had a 2 × 2 design, crossing DEFINITENESS (definite vs. indefinite) and PLURAL MARKING (the *–men* form vs. the bare form), resulting in four conditions (k = 6 per condition). Among the four conditions, only the "indefinite + *men*" condition is expected to be rejected. Sample items are provided in (3).

(3) **Context forcing a <u>definite</u> plural interpretation of the critical nominal:**
John could not find his two sons on a trip to a park. He said…

a. & b.
<u>Critical sentence: with vs. without *–men*</u>
Wo yao zhaodao haizi(*–men*)
I want find child(–PL)
'I need to find the children.'

Context forcing an <u>indefinite</u> plural interpretation of the critical nominal:
Tom saw an advertisement, saying that a hospital is recruiting new doctors. He said…

c. & d.
<u>Critical sentence: with vs. without *–men*</u>
Yiyuan zai zhao yisheng(*–*men*)
Hospital ASP recruit doctor(–PL)
'The hospital is looking for (*the) doctors.'

The results (see Figure 1) show that the native speakers performed as expected, but the L2ers did not distinguish between these conditions.

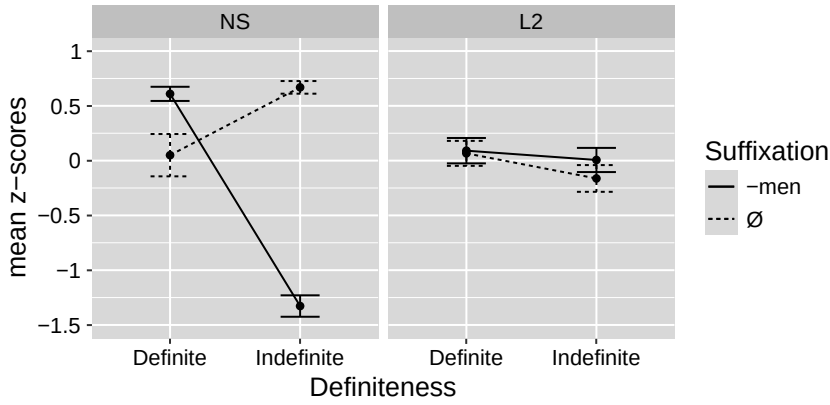

Figure 1. Mean *z*-transformed ratings from Wang (2020), native Mandarin speakers (on the left) and L2ers (on the right). Error bars represent standard errors of the mean.

There are a few limitations in this study, though. First, the majority of the L2 participants had low levels of Mandarin proficiency (most were in their first year of Mandarin classes); so it is unknown whether L2ers with higher proficiency would be more target-like. Second, the fact that the context paragraphs were in English might have affected the results. The present study attempts to address these and other shortcomings, as described below in §5.2.

5. The present study

5.1. Participants

A total of 16 L1-English L2ers of Mandarin and 24 native Mandarin controls have taken part in the present study. In addition to a language background questionnaire, all participants completed an independent measure of Mandarin proficiency, viz., a C-test originally developed by Wen (2015). The demographic information of the participants, including the mean C-test score (out of 50) for each group, is presented in Table 2.

Table 2. Demographic information and proficiency scores for participants (*SD*s in parentheses).

Group	*n*	Age	Length (in years) of learning Mandarin	Proficiency score (Max = 50)
Native speakers	24	32.33 (9.83)	N/A	47.96 (1.11)
L2ers	16	33.88 (13.75)	5.25 (3.62)	16.44 (8.52)

Note that the proficiency level of the L2ers is not very high; they are in their second and third years of Mandarin classes. Due to the small size, the L2 participants were not divided into sub-groups based on Mandarin proficiency scores. Instead, they were treated as a single group of (high-)intermediate L2ers.

5.2. Contextualized acceptability judgment task

As with Wang (2020), a contextualized AJT was used as the main experiment to test for the definiteness constraint on Mandarin *–men*. This time, however, the contexts are provided in Mandarin. This means that the (in)definite article cues in Wang's (2020) English contexts do not exist in this experiment. In other words, participants have to use the context to infer the definiteness status of the critical nominal. Another difference is that this time we controlled for the position of the critical nominal in the critical sentences, such that it never occurs in the subject position; this was done to reduce the possibility of a confound, since subjects tend to be definite. Finally, the experiment had a Latin-square design, so that each participant saw only one version of the 2 × 2 factorial conditions.

An example item in each of the four critical conditions ($k = 5$ each) is given in (4). In the first context, a definite reading of the critical plural nominal *haizi* 'child' is intended. As definite nominals are compatible with both a *–men* form and a bare form, both (4a) and (4b) should be acceptable. In the second context, an indefinite reading of the critical plural nominal *haizi* 'child' is intended. In this case, only the bare form in (4d), not the *–men* form in (4c), is allowed.

(4) **Context intended to force a <u>definite</u> plural interpretation of the critical nominal:**
Zhang-laoshi jia-li yao kai paidui. Ta xiang jiao
Zhang-teacher home-in will hold party he want ask
tade liang-ge haizi bang ta yiqi zhunbei.
his two-CL child help he together prepare
'Teacher Zhang will have a party at home soon. He wants to ask his two children to help him to prepare.'

a. & b.
<u>Critical sentence: with (k = 5) vs. without *–men* (k = 5)</u>
Zhang-laoshi dasuan zhao haizi(*–men*/Ø) bangmang.
Zhang-teacher plan find child(–PL/Ø) help
'Teacher Zhang plans to ask (the) children to help him.'

Context intended to force an <u>indefinite</u> plural interpretation of the critical nominal:
Zhang-laoshi jia-li yao kai paidui. Ta xiang jiao
Zhang-teacher home-in will hold party he want ask
ji-ge linju-de haizi bang ta yiqi zhunbei.
several-CL neighbor-POSS child help he together prepare
'Teacher Zhang will have a party at home soon. He wants to ask some children in the neighborhood to help him to prepare.'

c. & d.
<u>Critical sentence: with (k = 5) vs. without *–men* (k = 5)</u>
Zhang-laoshi dasuan zhao haizi(*–men*/Ø) bangmang.
Zhang-teacher plan find child(–PL/Ø) help
'Teacher Zhang plans to ask (*the) children to help him.'

In addition to the critical conditions, two types of fillers were included, with two conditions in each, as laid out in Table 3. To balance acceptability across conditions in the experiment, three of the four filler conditions (k = 5 each) were designed to be unacceptable.

Table 3. The four filler conditions of the acceptability judgment task.

Type 1		Type 2	
Singular + Ø (k = 5)	Singular + *–men* (k = 5)	Indefinite + preverbal (k = 5)	Definite + postverbal (k = 5)
✓	✗	✗	✗

The purpose of the two conditions of Type 1 fillers was to test for the impossibility of *–men* with singular nominals. Performance on Type 1 fillers also served to screen the L2ers. The purpose of the two conditions of Type 2 fillers was to test the relationship between definiteness and word order by way of unaccusative

verbs. The reason for using unaccusative verbs is that their sole nominal argument can be positioned either preverbally or postverbally, depending on the definiteness status of the nominal (e.g., Huang, 1987): Definite nominal arguments tend to precede unaccusative verbs; indefinite nominal arguments tend to follow them. Performance on Type 2 fillers allows us to check whether L2ers are sensitive to the (in)definiteness information provided in the Mandarin contexts.

5.3. Procedure

Participants were tested individually by the first author via a Zoom meeting. All participants completed the three tasks in the following order: the contextualized AJT, the language background questionnaire, the C-test. The instructions for each task were in writing, in English for the native English speakers and in Mandarin for the native Mandarin controls. As for the contextualized AJT and the C-test, the participants could decide whether they preferred simplified or traditional Chinese characters. *Pinyin* was also provided for the contextualized AJT. The whole session lasted approximately 20 minutes for native Mandarin controls and 40–60 minutes for L2ers.

5.4. Results

Prior to analyzing the judgment data, all 'I don't know' responses were identified and removed. The remaining data were imported into R (R Core Team, 2020), and the individual mean ratings and *z*-transformed ratings for each condition were calculated. Since all L2 participants were target-like, as expected, on the screening items (i.e., Type 1 fillers, which, recall, test for the [+plural] feature of *–men*), no participant was excluded from statistical analysis. Figure 2 presents the *z*-transformed rating scores on the critical items.

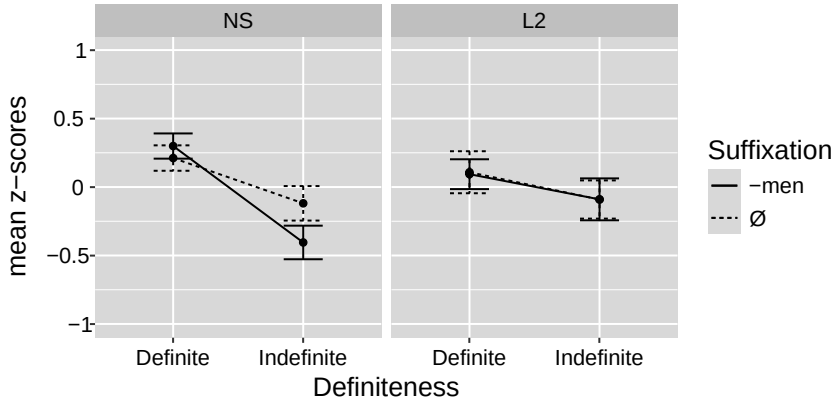

Figure 2. Mean *z*-transformed ratings on the critical items from native Mandarin speakers (on the left) and L2ers (on the right). Error bars represent standard errors of the mean.

A linear mixed-effects model[4] was fitted to the ratings from each group. The results reveal a statistically significant interaction between DEFINITENESS and PLURAL MARKING for only the native Mandarin controls ($p < .05$), reflecting their sensitivity to the impossibility of *–men* in the infelicitous indefinite condition.[5] The L2 results, by contrast, show no such sensitivity ($p > .05$), thereby suggesting that they failed to acquire the [+definite] feature of *–men* (see also §6).

As an exploratory analysis, in Figure 3 we plot individual L2 results on the two *–men* conditions, ordered on the *x*-axis by their (increasing) Mandarin proficiency on the C-test. The circles represent the acceptable "definite + *men*" condition; the triangles represent the unacceptable "indefinite + *men*" condition. Each L2 participant thus has both a circle and a triangle. (For native Mandarin speakers—not shown—the circles are always higher than the triangles.)

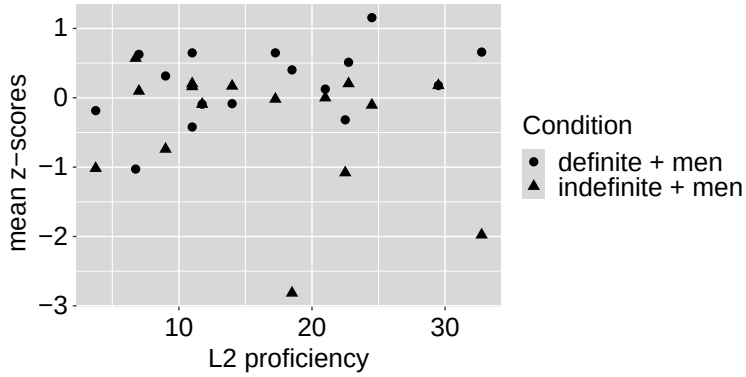

Figure 3. Mean *z*-transformed ratings on the two *–men* conditions for individual L2 participants.

As Figure 3 depicts, although there are some L2 participants who seem to evince the intended contrast between the two conditions ("definite + *men*" vs. "indefinite + *men*"), no pattern based on Mandarin proficiency could be found.

[4] The model formula was as follows: lmer(zscores ~ Definiteness * Suffixation + (1|Participant) + (1|Item).

[5] One might wonder why the native Mandarin speakers did not rate the unacceptable "indefinite + *men* condition" lower, as compared to the pilot. We think this is because when the critical indefinite nominal from the context sentence is encountered for the second time in the critical sentence, the latter could be treated as a ***continuation*** instead of just a ***description*** or ***paraphrase*** of it. The point here is that it is very challenging to introduce indefinite nominals into a discourse and ensure that they retain their indefinite status.

Figure 4 displays the filler item results.

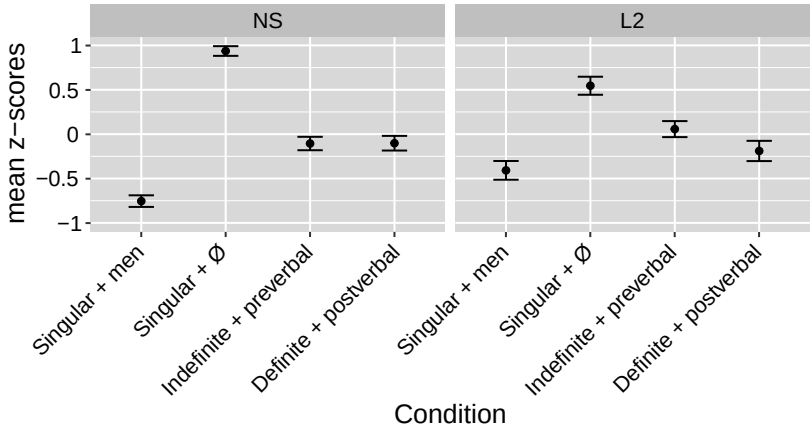

Figure 4. Mean *z*-transformed ratings on the filler items from native Mandarin speakers (on the left) and L2ers (on the right). Error bars represent standard errors of the mean.

Here the native Mandarin controls (on the left) and the L2ers (on the right) pattern similarly. From this finding we infer that the differential acceptability patterns that emerged on the critical items (Figure 2) do not seem to stem from L2ers' inattention to the task or to their blanket insensitivity to definiteness.

6. Discussion

To summarize: Unlike the native Mandarin controls, the (high-)intermediate L2ers in the present study failed to show sensitivity to the definiteness of *–men.*

So, what does their allowing *–men* in indefinite contexts indicate about their Interlanguage grammar? We consider the feature matrix first and then the conditioning environments.

The L2ers might know that the feature matrix of *–men* is different from that of English plural *–s*, but what we know for sure is that they have not acquired the [+definite] feature of *–men*.

As for the conditioning environments, the L2ers know that there is no obligatory environment for *–men*, since they accept the bare and *–men* forms of nominals to the same extent. However, what they failed to acquire is that the occurrence of *–men* in indefinite contexts is prohibited, unlike the case with definite contexts, where it is optional.

Let's now revisit the learnability question on whether L1-English speakers can acquire the [+definite] feature of Mandarin *–men.* If we assume that this is indeed learnable, one way one might think this could work is by using indirect negative evidence. The idea is that L2ers would use the distributional properties

of the input to form inductive generalizations about the TL. For the phenomena at issue, plural indefinites do not occur with *–men*. But the problem here is ***optionality***, because definite ([±human]) nominals likewise occur without *–men*. So, in short, the absence of *–men* cannot ineluctably lead an L2er (or an L1 child, for that matter) to the conclusion that the interpretation of that intended plural nominal is indefinite.

Taken together, our finding that the L2 participants in the study failed to acquire the [+definite] feature of *–men* corroborates Lardiere's (2017) conjecture that optionality in the morphological realization of features—which arguably leads to their low detectability—could be a source of L2 acquisition difficulty. In the present case, this means that because detecting the conditioning environment for *–men* as one of restricted optionality is difficult, acquiring the [+definite] feature is consequently difficult. This is to say, the fact that the conditioning environment is not general optionality but rather optionality for only [+definite] nominals is the source of the difficulty.

But there is then a chicken-and-egg problem. On the one hand, the input and/or the discourse context manifests the conditioning environments from which L2ers need to be able to detect or infer the relevant features as realized in individual morpholexical items. On the other, determining what the conditioning environments are constitutes part of the learning task itself.

So, can L1-English L2ers of Mandarin ever crack the learnability problem (all arguably caused by that first step of equating *–men* to English plural *–s*) and thus acquire the [+definite] feature of *–men* and narrow the optional conditioning environment to definite contexts? At this point, the only secure conclusion we can make is that more research is needed to understand the L2 acquisition of Mandarin plural *–men*—specifically, much more advanced L2ers should be tested—and more generally, more research is needed to shed light on learnability issues in the L2 acquisition of functional morphology.

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