# Acquisition of Dutch plural by native speakers of Mandarin Chinese and English 

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## 1. Introduction

There is a striking difference between first (L1) and second (L2) language acquisition (Birdsong, 1999). All children that are exposed to first language input will follow the same stages of acquisition and end up acquiring a full language system. In contrast, there are many factors that influence the acquisition of a second language: age, sex, aptitude and motivation, cognitive style, personality and learning strategies (Saville-Troike, 2005).

An explanation of these facts is offered by linguists in the form of the Critical Period Hypothesis. The Critical Period Hypothesis states that "there is a limited developmental period during which it is possible to acquire a language, be it L1 or L2, to normal, native-like levels. Once this window of opportunity is passed, however, the ability to learn language declines" (Birdsong, 1999).

In this thesis the question of whether the Critical Period Hypothesis is a viable theory involved in explaining the differences between first and second language acquisition will be explored further. For this purpose, a small empiric study was composed in which the acquisition of Dutch plural by native speakers of English and Mandarin Chinese were compared.

This thesis will consist of several parts. In the theory section, there will be a discussion of some of the frameworks in second language acquisition (SLA) that are relevant to this study, as well as a summary of relevant previous research. This section will also provide information regarding the formation of plural in the languages used in this study (Dutch, English and Chinese) and an explanation of why these languages were chosen for the study.

The Method and Results sections will provide a complete overview of the study itself and the results, respectively. In the Discussion section I will come back to the Critical Period

Hypothesis, and conclude that some parts of the acquisition of Dutch plural are in accordance with the Critical Period Hypothesis, while others are not.

## 2. Theory

In this section there will be a discussion of some theories and ideas that are central to the topic of second language acquisition, particularly transfer and the theory of principles and parameters. Following this, there will be a discussion of relevant SLA research, particularly research done by Bliss (2006) and De Garavito (2007) which will be important as a background to this thesis. The third part of the theory section contains detailed information on the formation and realization of plural forms in Dutch, English and Mandarin Chinese.

## Transfer

The term 'transfer' is defined by Gass \& Selinker (1994) as 'the psychological process whereby prior learning is carried over into a new learning situation' (as cited in Ueyama, 2000). In second language acquisition the term transfer is used to indicate the process in which knowledge from one language is applied to or used in another language. Most commonly this refers to situations in which people apply knowledge from their L1 to an L2. Saville-Troike distinguishes between two types of transfer: positive transfer and negative transfer or interference (2005). Positive transfer occurs 'when an L1 structure or rule is used in an L2 utterance and that use is appropriate or correct in L2', while negative transfer occurs 'when an L1 structure or rule is used in an L2 utterance and that use is inappropriate and considered an error' (p. 19).

## Principles and parameters

Principles are 'properties of all languages in the world' (Saville-Troike, 2005) that are assumed to be innate knowledge. These principles describe rules for natural language that are never violated, even when there are other logical possibilities. An example described by SavilleTroike (2005) is that every phrase in every language must contains the same elements, among which the head of the phrase. For example a noun phrase (NP) must have a noun (N), a verb phrase (VP) must have a verb (V), etc.

Some of these principles allow for a choice between (usually two) settings; these are called parameters. The example in the previous paragraph has a parameter choice that determines the placement of the head in the phrase. The options are head-initial and head-final, placing the head at the front or the back of a phrase, respectively. English usually opts for the head-initial option, e.g. verbs precede other elements in the verb phrase, and propositions ( P ) precede all other elements in a prepositional phrase (PP; see (1)). Japanese, as a head-final language, does the opposite and places heads at the end of their phrases (see (2)).
(1) John [kicked the ball] $]_{\mathrm{VP}}$

John rode [in a car] ${ }_{\text {PP }}$
(2) John-wa [booru-wo ketta $]_{\mathrm{VP}}$

John ball kicked
John-wa [kuruma-ni $]_{\text {PP }}$ notta
John car-in rode
(heads of phrases are underlined; examples taken from Saville-Troike, 2005)

This theory is relevant for second language acquisition, because it offers an explanation of what it is that L 2 learners transfer from L 1 to L 2 . When learning a second language, L 2 learners
usually apply their L1's parameter setting to L2. This can result in positive transfer, if the parameter settings are identical or if the possibilities L1 offers are contained within (a subset of) the possibilities L2 offers. In all other cases it might result in negative transfer.

## Relevant research

## Bliss 2006

Bliss (2006) discusses three different theories regarding the transfer of L1 Chinese elements in the acquisition of L2 English inflection. Firstly, she looks at the Consonant Cluster Reduction Hypothesis, which proposes that errors in L2 production stem from phonological differences between English and Chinese. Secondly, she evaluates the Prosodic Transfer Hypothesis, which suggests that errors in the production of inflection might be due to differences in prosodic structure between English and Chinese. Thirdly, Bliss discusses the Failed Functional Features Hypothesis, which theorizes that inflectional errors are caused by the lack of activation of certain morphosyntactic features in L1. In this particular instance, this refers to the lack of a [plural] feature in Mandarin Chinese.

Bliss compares each of these proposals to data provided in a study by Jia (2003). This study documented the use of plural morphology by ten L1 speakers of Mandarin Chinese between the ages of five and sixteen (at the start of the study) as they were learning English after immigrating to the US.

According to Bliss, Jia's data suggests the third hypothesis, Failed Functional Features Hypothesis, is most likely the correct one. The other two hypotheses account for part of the data, but fail to explain some errors (e.g. overgeneralization errors) made by the children in this study. The Failed Functional Features Hypothesis seems to account for the both the type and distribution of errors found in the production of English plural morphology.

Bliss shows through examples that Mandarin Chinese does not have an active [plural] feature. Based on the data provided in Jia's study, Bliss concludes that the feature [plural] is not acquired by native speakers of Mandarin Chinese, even after having been exposed to English for several years.

This does not mean, however, that these speakers are incapable of creating plurals. According to Bliss, 'learners come to recognize that a regular rule of pluralization affects nouns referring to multiplicities'. This results in over-application of plural morphology, for example the use of plural affix -s for mass nouns and irregular plurals.

## De Garavito 2007

De Garavito (2007) studied the acquisition of Spanish plural by 42 high school students who were native speakers of French. These students were at the end of either their first or second year of learning Spanish in a classroom; their proficiency was classified as 'low' and 'low intermediate' respectively.

De Garavito found that native speakers of French go through three different stages in the acquisition of L2 Spanish. In the first stage plural markers are not frequently present; in the second stage the $[-\mathrm{s}]$ plural is acquired; and in the third and final stage the $[-\mathrm{es}]$ plural is acquired as well.

Based on phonological constraints on French and Spanish syllables, as well as information on the formation of plural in Spanish, de Garavito proposes three parameters that control plural in Spanish.

The presence of three different stages in the acquisition of L2 Spanish suggests that parameter resetting is possible. In the first stage, native speakers of French (incorrectly) transfer French constraints on phonology to Spanish. This explains why no plural markers are present in
this stage. As the parameter is reset, L2 speakers enter stage 2 and start using the [-s] plural. Finally, L2 Spanish speakers learn in which cases to use [-es] plural, thereby entering stage 3: plural mastery.

This research suggests that it is possible to reset (phonological) parameters when learning a second language.

## Towell \& Hawkins 1994

According to Towell \& Hawkins (1994), Hulk (1991) studied the transfer of word order from L1 Dutch to L2 French in secondary school pupils and university students. She found that Dutch word order was preferred initially, but through classroom exposure the parameter was mostly reset within three years.

Similarly, Towell \& Hawkins (1994) discuss research done by Clahsen \& Muysken (1986) which showed the stages that L1 speakers of Romance languages go through when learning L2 German. These stages also show initial (negative) transfer of an L1 parameter setting, followed by parameter resetting.

Towell \& Hawkins (1994) claim that we should expect 'to find observable differences in development between L1 and L2 learners which can be directly attributed to the influence of L1 parameter settings on the latter'.

In summary, we have seen an example of SLA in which parameters cannot be reset (the [plural] feature in Chinese) and some examples in which parameters can be reset (e.g. Spanish plurals).

## Dutch, Mandarin Chinese and English

Following the research done by Bliss and De Garavito, this study will concern the acquisition of plural parameters. Dutch was chosen as the target language, due to the relative ease of finding L2 speakers of Dutch in the Netherlands. Two different L1s were selected: Mandarin Chinese, because it does not have a [plural] feature; and English, which does have the feature [plural], but creates plural differently from Dutch. In this section, the formation of plural in all three of these languages will be presented.

## Dutch Plural

In her dissertation, Van Wijk (2007) describes the properties of Dutch pluralization extensively. This section will contain a summary of the set of rules that control the formation of Dutch plural, as presented by Van Wijk (2007). The emphasis lies on how regular plural is formed, but irregular Dutch plural forms will be discussed briefly as well, for the sake of completeness.

Dutch plural is created in one of three ways: through affixation, through a combination of affixation and sound change, or through a change to the ending of the stem. The default (productive) Dutch plural affixes -s and -en are found in the first group; these will be discussed in the section titled regular plural.

## Irregular plural

The first group (plural created through affixation) contains not only the default suffixes -s and -en, but the irregular/unproductive suffix -eren can be found here as well. For some examples see (3).The second group concerns plurals that are created through both sound change and affixation, e.g. the nouns in (4). The last group describes words that go through a change in
the ending of the stem in order to form plural. This group contains loan words from Latin, Greek and Italian that have kept their original plurals, see (5). These words commonly have a second, regular, plural that follows the default plural pattern, e.g. museum - museums.
(3) Kind - Kinderen

Rund - Runderen
Volk - Volkeren
(4) Schip - Schepen

Stad - Steden
Blad - Bladeren
(5) Museum - Musea

Politicus - Politici

## Regular plural

When it comes to regular plural, Van Wijk (2007) proposes two default options: -en [ə] or $[ə n]$ (6) and $-s[s]$ (7). Both options fall into the first category: pluralization through affixation.
(6) Schoen - schoenen

Gitaar - gitaren
Trui - truien
Klas - klassen
Stoel - stoelen
Perzik - perzikken
(7) Auto - auto's

Bezem - bezems
Paprika - paprika's

$$
\begin{aligned}
& \text { Café - cafés } \\
& \text { Baby - baby's } \\
& \text { Kamer - kamers }
\end{aligned}
$$

The distribution of -en or -s plural affixes is determined by two phonological factors: sonority and word stress, or rhythm. There is no clear boundary between the two plural domains, partially due to the interaction between these factors, which means there is a grey area in which certain word endings and word-stress patterns can theoretically get -en or -s. In the following sections both factors will be described and discussed; examples and exceptions will be provided as well.

## Sonority

Sonority, roughly, describes how 'vowel-like' a sound is (Kooij \& Van Oostendorp, 2003). The sonority hierarchy (as shown in Van Wijk, 2007) can be found in (8):
(8) Plosives < fricatives < nasals < liquids < glides < vowels
[ obstruents ] [ sonorants ]
In this hierarchy, vowels are most sonorant and plosives least - 'sonority increases from left to right on the scale'. Van Wijk (2007) described the sonority factor as follows: final clusters should have falling sonority. In other words, clusters at the end of syllables should decrease in sonority. In terms of Dutch plural this means the -s affix is usually not found following plosives or fricatives, as it would lead to clusters that have rising or equal sonority, respectively. The examples (taken from Van Wijk, 2007) in (9) show three obstruent-final nouns and their plural forms, which are created using the -en affix.
$\begin{array}{rll}\text { (9) } & \text { perzik } & \text { perziken } \\ & \text { klok } & \text { klokken }\end{array}$

## kalief kaliefen

Nouns that end in anything but an obstruent can take the -s affix, because it would lead to falling sonority in the rhyme.

The expression of the relation between sonority and final sound is proportional, meaning that the likelihood of -s plural increases as sonority increases, and decreases as sonority decreases. Based on this fact, one can conclude that the sonority factor is most prevalent towards the far ends of the sonority scale, concerning nouns ending in (back) vowels and nouns ending in obstruents.

Towards the most sonorant end of the scale, nouns ending in back vowels $/ \mathrm{u} /, \mathrm{lo} / \mathrm{and} / \mathrm{a} /$ almost exclusively get -s plural (10). The only exceptions to this are the words koe [ku] - koeien [kujə] and vlo [flo] - vlooien [flojə]. Towards the least sonorant end of the scale, words ending in obstruents prefer the -en plural. Sibilant-final nouns form the most extreme example of this; they exclusively take -en plural. Some examples of this can be seen in (11). On the other hand, nouns that end in front-vowels or sonorants, and therefore fall in the 'middle' of the sonority scale, show both -en and -s pluralization. In Dutch, front vowels $/ \mathrm{e} / \mathrm{/} / \mathrm{i} /$, / $\varnothing /$ and $/ \mathrm{y} / \mathrm{can}$ be found in word-final positions. These take either -en or -s plural, as can be seen in (12). Similarly, nounfinal sonorant sounds can take either -s or -en plural as well (13).

| (10) | schwa | /'§wa/ | /'Swas/ |
| :---: | :---: | :---: | :---: |
|  | bureau | /by'ro/ | /by'ros/ |
|  | taboe | /ta'bu/ | /ta'bus/ |
| (11) | tas | /tas/ | /tasən/ |
|  | atlas | /atlas/ | /atlasən/ |
|  | dreumes | /drøməs/ | /drøməsən/ |
|  | notaris | /no'tarıs/ | /no'tarısən/ |


| (12) | café | /ka'fe/ | /ka'fes/ |
| :--- | :--- | :--- | :--- |
|  | zee | /'ze/ | /'zejən/ |
|  | ski | /'ski/ | /'skis/ |
|  | fobie | /fo'bi/ | /fo'bijən/ |
| (13) | balkon | /bal'kon/ | /bal'kons/ |
|  | ballon | /ba'lon / | /ba'lonən/ |

Two types of sounds do not seem to follow this system: glides and diphthongs, both of which typically take -en instead of -s .

## Word stress

A second factor, rhythm or word stress, has an influence on the distribution of -en and -s plural in Dutch as well. This factor states that Dutch 'nouns should end in a trochaic stress pattern' (p. 38; Van Wijk, 2007). A trochaic stress pattern is defined by Booij \& Van Santen (1998) as 'a combination of two syllables, of which the first one carries the stress' (p. 87, own translation).

For the formation of plural forms, this means that nouns that have a stressed final syllable prefer -en, while nouns that do not have a stressed final syllable prefer -s. The -en plural affix is never stressed, thus adding an unstressed syllable to the end of a word. It is, therefore, ideal for words that end in stressed syllables, as it will create a trochee. The - s plural affix does not create a new syllable, and is therefore preferred by words that already follow the trochaic pattern (do not have a stressed final syllable). The examples in (14) illustrate this effect, by giving multiple examples of words that end in similar syllables, but differ in stress.

| (14) | kajak | /'kajok/ | /'kajoks/ |
| :---: | :---: | :---: | :---: |
|  | barak | /ba'rak/ | /ba'rakən |


| canon | /'kanən/ | /'kanəns/ |
| :--- | :--- | :--- |
| kanon | /ka'nən/ | /ka'nənən/ |
| pony | /pəni/ | /pənis/ |
| genie | /3ə'ni/ | /3ə'nijən/ |

Finally, in words that have antepenultimate stress either -en or -s can be used. Some examples of this are shown in (15).
(15) 'kakkerlak kakkerlakken
'uniform uniforms

## Interaction

The two factors discussed in the previous sections can make contradicting predictions. For example in the word 'kajak' (shown in (14)), one might expect -en plural based on the sonority factor, or alternately one might expect -s plural based on the rhythm factor. According to Van Wijk (2007), there are few areas in which the two factors agree. Table 2 shows the different possibilities for final sound and final syllable stress; the asterisks indicate categories that both factors agree on.

|  |  | final syllable |  |
| :---: | :---: | :---: | :---: |
|  |  | stressed | unstressed |
| $\begin{aligned} & \vec{B} \\ & \overrightarrow{0} \\ & 0 \\ & \overrightarrow{0} \\ & \text { an } \end{aligned}$ | diphthong | -en* | -en |
|  | obstruent | -en* | -en |
|  | sonorant | -en | -s |
|  | front vowel | -en/-s | -en/-s |
|  | back vowel | -s | -s* |

Table 2: distribution of -en and -s in Dutch pluralization, taken from Van Wijk (2007), p. 42

Areas in which both factors disagree usually show a weak preference for one plural affix or the other, but even this is not always the case. These preferences are shown in table 1 as well, particularly in the cells unmarked by an asterisk.

## Chinese plural

Mandarin Chinese is one of the best examples of an isolating or analytic language, i.e. 'a language where each morpheme may occur as a word in isolation' (Katamba \& Stonham, 1993). Bound morphemes are infrequent in Mandarin Chinese, and 'words virtually never have inflectional affixes'. Instead, information about e.g. number, tense and person is conveyed through separate words.

Li and Thompson (1989) describe Mandarin Chinese as a language in which it is not obligatory to mark the category number in nouns; the distinction between singular and plural is not a necessity. For example, the word shū may refer to either 'book' or 'books'. This complies with Bliss's (2006) claim that Mandarin Chinese does not possess the [plural] feature.

If plurality is expressed in Mandarin Chinese, it is usually through a separate word, which means there is no added morphological complexity. This is in accordance with Katamba \& Stonham's characterization of Mandarin Chinese (1993) that was provided in the first paragraph of this section.

There is one exception to this lack of distinction between singular and plural: the MENplural. The MEN-plural marks plurality in pronouns (16) and occasionally in nouns that describe people (17).

| nǐ | 'you' | nǐ-men | 'you (plural)' |
| :--- | :--- | :--- | :--- |
| tā | 'he/she' | tā-men | 'they' |
| (17) háizi-men | 'children' |  |  |

## English plural

English is described as a language that is mostly isolating, while being synthetic or inflecting to a certain extent. Inflecting languages are characterized as languages in which words usually consist of several morphemes and 'there is seldom a one-to-one matching of morphemes with morphs' (Katamba \& Stonham, 1993). In English, information about e.g. number, tense and person is conveyed through bound morphemes (suffixes), creating a clear contrast with Mandarin Chinese. In English, the [plural] feature is present, but the rules that govern English plural are slightly different from the Dutch.

Like the Dutch plural, the English regular plural is formed through affixation. English makes use of three allomorphs /-Iz/, /-s/ and /-z/. According to Katamba \& Stonham (1993) the distribution of these allomorphs is 'phonologically conditioned' and determined by the final sound of a noun. Nouns that end in a sibilant (like $/ \mathrm{s} /, / \mathrm{z} /, / \mathrm{J} /, / \mathrm{z} / / \mathrm{t} / /$ and $/ \mathrm{d} 3 /$ ) select the $/-\mathrm{Iz} /$ suffix, as can be seen in (18).

| (18) | fishes | /fifiz/ |
| :--- | :--- | :--- |
|  | mazes | $/$ meiziz/ |
|  | beaches | /bi:tfiz/ |

The allomorph /-s/ is selected for non-sibilant, voiceless consonants (/p/, /t/, /k/, /f/ and $/ \theta /$ ). Some examples of this can be found in (19).

| cups | $/ \mathrm{k} \wedge \mathrm{ps} /$ |
| :--- | :--- |
| carts | $/ \mathrm{ka}: \mathrm{ts} /$ |

laughs /la:fs/
Finally, nouns that end in any other sound select the allomorph /-z/. In practice this means that nouns ending in non-sibilant voiced consonants or vowels get this suffix. See (20).

| (20) | rooms | /ru:mz/ |
| ---: | :--- | :--- |
| keys | /ki:z/ |  |
|  | shoes | /ju:z/ |

Like Dutch, English has some irregular plurals. Some English nouns are pluralized through a sound change (see (21)), some take -n or -en plural (see (22)), for some nouns the singular and plural forms do not differ (see (23)), and finally some loan words keep the original plural (see (24)).

| (21) | woman | women |
| :--- | :--- | :--- |
|  | foot | feet |
|  | goose | geese |
|  | mouse | mice |
| (22) | ox | oxen |
|  | child | children |
| (23) | sheep | sheep |
|  | moose | moose |
|  | bison | bison |
| (24) | alumnus | alumni |
|  | millennium | millennia |

## Predictions

As was stated before, this study endeavors to investigate the nature of parameter resetting in Dutch plural. The expectation is that native speakers of English and Mandarin Chinese will make different types of errors, due to the differences between Mandarin Chinese and English. These expectations will be outlined in the following paragraphs.

According to Bliss (2006), speakers of Mandarin Chinese lack the ability to acquire the [plural] feature, but will be able to 'recognize and commit to memory the patterns of distribution of the morphemes associated with such features'. This means native speakers of Mandarin Chinese might leave out plural forms where they are necessary, as well as over-apply Dutch plural morphology. This last phenomenon is typically found in nouns that indicate any kind of multiplicity.

De Garavito's research (2007) shows that native speakers of French are able to reset their plural parameters when acquiring the Spanish plural. Based on this, the expectation is that native speakers of English can reset their plural parameters when learning Dutch plural.

To summarize, the current study will investigate the role a speaker's L1 plays in the acquisition of the Dutch plural. More specifically, native speakers of Mandarin Chinese and native speakers of English were tested on their knowledge of the Dutch plural, with the purpose of finding out if there are any differences in acquisition based on first language. We expect native speakers of Chinese to make different types of errors than native speakers of English, because research suggests that members of the former group are not able to acquire the [plural] feature fully.

Additionally, this study will take a look at whether second language learners struggle more with some types of plural than others. This information might provide an insight into the types of parameters that govern Dutch plural.

## 3. Method

## Survey

Data was collected through an online survey; a paper version of the survey can be found in Appendix A. An online survey was used, because it provided a cheap and relatively quick way to reach people in and outside of the Netherlands. The survey was initially distributed through Facebook groups and pages aimed specifically at learning Dutch. All native speakers of English were found this way. Additionally, the survey was sent to some Chinese speaking staff at Utrecht University and a mailing list of native speakers of Mandarin Chinese who have participated in linguistics experiments before.

## Participants

Initially 106 responses to the online survey were recorded. 61 responses were deleted because the responses were incomplete, not in Dutch or because the participants did not speak Mandarin Chinese or English as an only first language.

This left 45 participants in this study: 24 females, 20 males and 1 other. 33 participants spoke English as a native language and 12 spoke Mandarin Chinese. An overview of the different gender and language groups is shown in table 3 . The participants' ages ranged from 15 to 60 , averaging at $28.49, \mathrm{SD}=11.57$.

Table 3: Number of participants in the study per gender and native language

| Female | Male | Other | Total |
| :--- | :--- | :--- | :--- |


| English | 18 | 14 | 1 | 33 |
| :--- | :--- | :--- | :--- | :--- |
| Mandarin Chinese | 6 | 6 | 0 | 12 |
| Total | 24 | 20 | 1 | 45 |

To ensure that there was no difference in exposure to Dutch between the different language groups, participants were asked to provide some information concerning their experience with Dutch. Specifically, participants were asked to indicate whether they had ever taken any Dutch language courses, and if so, how many hours. The amount of hours that participants spent in Dutch language course ranged from 0 to 910 , mean $=72.49$ and $\mathrm{SD}=$ 164.41. Additionally, participants were asked to indicate how many months they had lived in the Netherlands in total. This ranged from 0 to 240 months, mean $=26.89, \mathrm{SD}=60.62$.

Finally, participants were asked to estimate their own competence on a 5-point scale. Answers to this question were converted to a number between 1 (least competent) and 5 (most competent). There was one missing value; 4 participants indicated having next to no knowledge of Dutch, score 1; 27 estimated their own competence at 2; 10 participants estimated their own competence at 3 ; and the remaining 3 participants estimated their own competence at 4 . No one estimated their own competence at 5 'near native'.

## Words

Based on the sonority and rhythm factors, discussed in the Dutch plural section, five categories of words were created. These categories are 1) words ending in diphthongs, 2) words ending in obstruents, 3 ) words ending in sonorants that take -en plural, 4) words ending in sonorants that take -s plural and 5) words ending in back vowels. A sixth category with nouns that have irregular plural was added as well.

For every category six different Dutch words were selected. An attempt was made to vary stress pattern and final sound of words within a category as much as possible. The words that were used for the experiment are shown, by category, in table 4. Cronbach's alpha for the 36 tested items showed the internal consistency was .83 . This is good score for research purposes and suggests that these items describe a single underlying construct.

Table 4: Words used in experiment, by category

| Diphthong | Obstruent | Sonorant |  | Back vowel | Irregular |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | -en | -s |  |  |
| Kooi | Klok | Ballon | Tafel | Taboe | Stad |
| Boei | Kalief | Gitaar | Kamer | Bureau | Schip |
| Leeuw | Tomaat | Juweel | Keuken | Schwa | Ei |
| Trui | Mens | Stoel | Bezem | Emoe | Kind |
| Zenuw | Monnik | Boom | Wandelaar | Kano | Snelheid |
| Vrouw | Ticket | Vandaal | Nylon | Oma | Broer |

Using an online list randomizer, the items were randomized. The entire list of items in the order they were tested can be found in Appendix A, which shows the entire survey. Scoring

Each of the 36 plural nouns entered by the participants was judged on correctness. Spelling was not taken into account, so not just kano's was marked correct, but kanos and kanoes as well. Any variation of an -en plural, like kanoen, kanoën or kanon was marked incorrect. The same principle was applied to words that take -en plural; klokken, klooken and kloken were marked correct, while kloks - or any variation of -s plural - were marked incorrect.

All correct scores were coded as 1 , while the incorrect answers were coded as 0 . Using these scores, a 'total plural score' was calculated for every person. This total score can range from 0 to 36 and offers an indication of someone's command of the Dutch plural.

Additionally, scores for the different word categories diphthong, obstruent, sonorant -en, sonorant -s, back vowel and irregular were calculated in the same way. This gave us to scores between 0 and 6 that indicates someone's command of a certain aspect of Dutch plural.

## 4. Results

## Effect of native language on total plural score

An ANCOVA was performed to determine the influence of native language on total plural score, controlling for the effects of exposure to Dutch (both the number of hours a participant spent in Dutch language courses and the number of months a participant has lived in the Netherlands).

Before interpreting the outcome of the ANCOVA, its assumptions were tested. The Shapiro-Wilk test showed that the plural scores were approximately normally distributed for the native speakers of English $(p=.776)$ as well as the speakers of Mandarin Chinese $(p=.102)$.

There was no significant interaction effect between native language and the amount of time a participant had lived in the Netherlands $(\mathrm{p}=.190)$ or between native language and the number of hours a participant spent taking Dutch language courses $(\mathrm{p}=.436)$. This means the assumption of homogeneity of regression was not violated.

The assumption of homogeneity of variances was supported by the absence of a significant interaction effect between the independent variable (native language) and the
covariates (months someone has lived in the Netherlands and hours spent on Dutch language courses $), \mathrm{F}(1,33)=1.79, \mathrm{p}=.190$ and $\mathrm{F}(1,33)=.62, \mathrm{p}=.436$, respectively.

The ANCOVA showed that, after accounting for the effects of living in a Dutch speaking country and the effects of taking Dutch courses, there was no statistically significant ( $\alpha=.05$ ) effect of native language on total plural score (and thus knowledge of Dutch plural), $\mathrm{F}(1,25)=$ $.01, p=.929, \eta^{2}=.0$. Table 5 shows the means and standard deviations for plural score found in the experiment as well as the estimated means and standard deviations after controlling for exposure to Dutch. The table shows that while there was a difference in plural score between the native speakers of English (mean $=23.25$ ) and the native speakers of Mandarin Chinese (mean = 26.91) in the tested sample, these differences all but disappear when exposure to Dutch is taken into account.

Table 5: Mean and standard deviation per language group, and estimated mean and standard deviation after controlling for exposure to Dutch

|  | Real |  | Estimated |  |
| :--- | :---: | :---: | :---: | :---: |
| Language | Mean | SD | Mean | SD |
| English | 23.25 | 5.82 | 24.22 | 1.12 |
| Mandarin Chinese | 26.91 | 5.90 | 24.44 | 1.99 |

## Effect of native language on plural score per category

An ANCOVA was used to compare scores for each of the plural categories of the different native languages (English and Mandarin Chinese). The same covariates, time spent in the Netherlands and time spent in Dutch language courses, were included to control for possible differences in exposure in the two language groups.

The ANCOVA showed that - when controlling for exposure - there were no significant effects of native language on how well participants did in pluralizing the following categories: nouns ending in diphthongs $\mathrm{F}(1,36)=.31, \mathrm{p}=.579$; nouns ending in obstruents $\mathrm{F}(1,35)=.07$, p $=.797$; -en nouns ending in sonorants $\mathrm{F}(1,36)=.77, \mathrm{p}=.328 ;$-s nouns ending in sonorants $(1$, 36) $=.84, \mathrm{p}=.367$; nouns ending in back vowels $\mathrm{F}(1,36)=.59, \mathrm{p}=.447$; and nouns that take irregular plural $\mathrm{F}(1,36)=0, \mathrm{p}=.992$. The results are summarized in table 6 , which also shows the estimated means and standard deviations.

Table 6: (Estimated) mean and standard deviation of total score per plural category

| Plural category | Language | Real | Estimated |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | Mean | SD | Mean | SD |  |
| Diphthong | English | 4.45 | 1.70 | 4.72 | .75 |
| Obstruent | Mandarin Chinese | 5.00 | 1.67 | 4.30 | .60 |
|  | English | 4.57 | 1.35 | 4.70 | .27 |
| Sonorant, -en | Mandarin Chinese | 5.18 | 1.17 | 4.86 | .48 |
| Sonorant, -s | Mandarin Chinese | 4.82 | 1.17 | 4.56 | .56 |
|  | English | 3.83 | 1.51 | 3.99 | .29 |
| Mandarin Chinese | 3.82 | 1.17 | 3.40 | .52 |  |
| Back vowel | English | 4.31 | 1.65 | 4.31 | .34 |
|  | Mandarin Chinese | 4.91 | 1.58 | 4.90 | .61 |
| Irregular | English | 2.14 | 1.66 | 2.43 | .32 |
|  | Mandarin Chinese | 3.18 | 1.66 | 2.42 | .58 |

## Effect of gender on plural score

An ANOCOVA was performed to examine the effect of gender on total plural score, controlling for exposure to Dutch (months lived in the Netherlands, hours spent in Dutch language courses). There is no significant effect of gender on plural score, $\mathrm{F}(2,34)=.29, \mathrm{p}=$ . 749 .

## Easiest and most difficult to learn

Using the mean plural scores shown in table 7, some analyses were done to determine whether the differences in score between the plural categories are statistically significant. To this end, 15 paired sample $t$-tests were performed, comparing the means of every possible pair of plural categories (e.g. diphthong \& obstruent, diphthong \& back vowel). Not every test result will be reported in this section, but instead the emphasis will lie on results that are both meaningful and statistically significant.

With a mean score of 2.40 , the participants scored significantly lower in the category irregular than they did in any other category ( $\mathrm{p}<.001$ for every pair). In the category sonorant s, participants scored significantly lower than they did in categories back vowel $(\mathrm{p}=.049)$, diphthong $(\mathrm{p}=.014)$, and obstruent $(\mathrm{p}=.003)$. Finally, the mean for category sonorant -en was significantly lower than the mean in category obstruent.

Table 7: mean plural score per category, from low to high

| Plural category | Mean |
| :--- | :--- |
| Irregular | 2.40 |
| Sonorant, -s | 3.86 |
| Sonorant, -en | 4.24 |
| Back vowel | 4.45 |
| Diphthong | 4.64 |
| Obstruent | 4.73 |

## Relationship total plural score and estimation of own competence

Kendall's tau-b indicated a positive correlation between a participant's actual competence (plural score) and the estimation of their own competence, $\tau=.323, \mathrm{p}=.012$, two-tailed, $\mathrm{N}=40$.

Figure 1 shows the scatter plot associated with this correlation.


Figure 1: scatter plot for estimation of own competence and total plural score

## 5. Conclusion and Discussion

This research aimed to find out whether there is an effect of native language (English or Mandarin Chinese) on the acquisition of Dutch (L2) plural, after controlling for exposure to the Dutch language (through language classes or living in a Dutch speaking area). In this section there will be a discussion of the results of this study, as well as some suggestions for further research.

## Native language \& gender

Based on the used sample we cannot conclude that there is an effect of native language or gender on success of acquisition of Dutch plural forms (plural score). In the following paragraphs I wish to discuss two aspects of the experiment that might explain why no differences were found, as well as suggestions for how it might have been improved.

First of all there is the issue of written vs. spoken language. The way the experiment was conducted did not allow for participants to hear the pronunciation of the words in question. This is a problem, because the word stress factor - which partially determines the plural suffix is chosen in Dutch - is based solely on pronunciation. Unless the participants were familiar with the words or with the rules of Dutch word stress placement, they might not have been able to correctly identify the syllable carrying the main stress. If this was the case, they may have applied the pluralization rules perfectly, while still ending up with an incorrect answer.

To solve this problem, future research should make sure that it is possible for participants to either listen to the words (through conducting an in-person interview, or through a recording) or see a written indication of where the main stress of every noun lies.

Secondly, there were only twelve participants in this study who spoke Mandarin Chinese as a native language. While the participants' scores for both language groups formed an approximate normal distribution, the pattern was much more obvious and recognizable for the English group. Figure 2 shows a gap between plural scores 20 and 24 for Mandarin Chinese speakers, while those are some of the most common scores in the English speaking group. It is possible that there is a (small) difference between the populations, but that it does not show up here because there were not enough Mandarin Chinese participants. For future research I recommend using at least 30 people in each category to ensure the data is normally distributed.



Figure 2: Frequency distribution of total plural scores for Mandarin Chinese and English

## Ease of acquisition

Based on the scores for nouns per Dutch plural 'category', we have learned that irregular plural forms are more difficult to learn than any type of regular plural. This is not very surprising, as irregular forms have to be learned and remembered separately.

More interestingly, it seems to be more difficult to determine the correct plural for nouns ending in sonorants, than it is for other types of nouns. I will present two possible explanations for this in the following paragraphs.

In the noun categories diphthong, obstruent and back vowel, the rhythm factor does not play a (large) role. Table 2 (repeated as table 8 below) shows that - regardless of main stress these three categories usually get -en, -en and -s plural, respectively. This, apparently, is either intuitive (e.g. because it is determined by a phonological principle that applies to all languages) or easier to learn for native speakers of both Mandarin Chinese and English.

In contrast, nouns ending in sonorants can commonly take either -en or - s plural. The choice for a plural suffix here, then, is based on whether the final syllable of a noun is stressed or not. This task was much harder for the second language learners, which resulted in them doing significantly worse in these categories.

I suspect that this means that the sonority factor is easier to learn or more intuitive for second language learners than the rhythm factor. This could also be interpreted as the resetting of parameters; if Dutch plural is guided by parameter settings, the sonority parameter might be reset very easily, while the rhythm parameter is not.

The second possibility is that this apparent difference between the sonority and rhythm factors is due to the nature of the experiment. The words were only available to the participants in written format. It is certainly possible to determine sonority based on writing, but written
language does not reveal rhythm. This means participants might have been unaware of the placement of the main stress. Future research could focus on this specifically, to see what caused this difference in competence. This research could potentially provide useful, practical information for second language learners and teachers.

|  |  | final syllable |  |
| :---: | :---: | :---: | :---: |
|  |  | stressed | unstressed |
|  | diphthong | -en* | -en |
|  | obstruent | -en* | -en |
|  | sonorant | -en | -S |
|  | front vowel | -en/-s | -en/-s |
|  | back vowel | -S | -s* |

Table 8: distribution of -en and -s in Dutch pluralization, taken from Van Wijk (2007), p. 42

## Methodology

The questionnaire that was used did not serve every purpose of this study well. The types of mistakes Bliss (2006) found in her study (overgeneralization, missing plural forms) are typical of spontaneous spoken language. The test used in the current study did not concern spontaneous spoken language, and did therefore not allow for a measurement of over-generalization.

Furthermore, there were no occasions in which there was a lack of plural form. It is impossible to tell if this was due to the participants' skill, or rather because they had been explicitly instructed to create plural forms. The second option seems likely.

While the questionnaire allows for comparisons between participants' ability to produce Dutch plural forms correctly, we cannot determine whether native speakers of Mandarin Chinese
and English make the different types of errors hypothesized in the Theory section. Future research should aspire to use spontaneous speech to solve this problem.

Lastly, I wish to comment on the extent to which this research may be generalized. Due to the selective manner in which participants were chosen, this research cannot be generalized to the entire population of people studying Dutch as a second language. At most it applies to people who speak Mandarin Chinese or English, have access to the Internet and are willing to participate in an online survey. I see no easy solutions to this problem, as there is no way to (truly) randomly select second language learners, but it is nonetheless worth mentioning.

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## Appendix A

Thank you for participating in this study. The purpose of this study is to investigate the competence of native speakers of English and Mandarin Chinese in Dutch plural forms. Participation in this questionnaire is voluntary and the data collected will be used for research purposes only. Completing the entire questionnaire should take no more than 5-10 minutes.

The questionnaire starts off with some questions regarding your experience with Dutch, followed by 36 nouns of which you will be asked to supply to plural form.

1. Please indicate your age in years.
2. Indicate your gender.

- Female
- Male
- Other

3. What is your native language?*

* Your native language is the language you feel most comfortable speaking, typically the language you use while thinking or while talking to your parents/siblings.
- English
- Mandarin Chinese
- Other / more than one language

4. How would you estimate your own competence in Dutch?

Near native o o o o o non-existent
5. Have you taken any Dutch language courses?

- No
- Yes,

6. (if yes) Please describe the period and intensity of any Dutch language courses you have taken below. For example:

Period: 10 weeks
Intensity: 4 hours per week
Period:
Intensity:
7. Do you live in the Netherlands right now or have you lived in the Netherlands in the past?

- No
- Yes

8. (if yes) Please describe how long you have lived in the Netherlands (in months or years).
9. Any other relevant comments (for example regarding your competence in Dutch or your native language) can be entered here: (optional)
10. In each box, please enter the correct plural form of the word in front of it. Its translation in English is also provided, but we are interested only in the Dutch plural. The format is as follows: (English word) Dutch word [ write your answer in this box ]

Here is an example, to give you an idea of how it works.
(Car) auto [ auto's ]

Important: Please do not use the internet or a dictionary to look up correct plural forms.

| (Emu) Emoe | $[$ |  |
| :--- | :--- | :--- |
| (Room) Kamer | $[$ | $]$ | | Ticket |
| :--- |
| Boom |

