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# Information status and L2 prosody

## A study of reference maintenance in Chinese learners of Dutch\*

Yan Gu and Aoju Chen

When referring, speakers vary prosody according to the information status of the referent. There is some work on L2 learners' use of prosody in encoding given and new information but not necessarily in the context of reference maintenance. The current study investigates how Chinese learners of Dutch use prosody (i.e., duration and pitch-related cues) in reference maintenance at different proficiency levels (intermediate vs. advanced) in Dutch via a picture-stories reading task. We have found that despite the similarities in Dutch and Mandarin Chinese in the use of prosody in reference, the intermediate learners differed from the advanced learners in not using duration and limited use of pitch. We propose an L1-transfer based account to explain this effect of proficiency.

### Introduction

In spoken and written discourse, a referent, e.g., a person, an animal or an inanimate object, can be referred to repeatedly after its first mention. The status of the referent thus changes from being new to being given in the context, independent of whether the referent is already identifiable to the hearer or the reader upon the first mention. This change is known as change in information status or referential newness-givenness (e.g., Lambrecht, 1994; Gundel & Fretheim, 2003). To encode such a change in a referent, language users vary their choice of linguistic expressions (e.g., a man, the man, Peter, he) according to the information status of the referent across languages. In

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\* This contribution is based on the first author's MA thesis project. The first author composed the test materials, conducted the experiments, annotated the data, and wrote the first draft of the paper. The second author was responsible for the theoretical framework, experimental design, statistical analyses and interpretation of results, and wrote the final version of the paper.

spoken discourse, speakers also rely on intonation for this purpose in many languages, even when the linguistic expression is kept the same. Generally, in these languages, new referents tend to be encoded with more intonational prominence than given referents and referents that may fall between the two ends of the referential newness-givenness continuum (Baumann & Grice, 2006; see Chen, to appear for a review).

L2 learners' use of referring expressions has been widely studied in various L1–L2 pairings. It has been found that L2 learners from different L1 backgrounds experience difficulty in using the appropriate expressions for reference to given referents (also referred to as 'maintained referents' in the literature), contra predictions based on cross-linguistic similarities. Specifically, beginning L2 learners often omit referents that have been introduced in the discourse, whereas intermediate L2 learners frequently use noun phrases to refer to maintained referents instead of pronouns or zero anaphora (e.g., Hendriks, 2003). As a result, intermediate L2 learners are perceived to be over-explicit in reference maintenance. Accounts for intermediate L2 learners' over-use of noun phrases in reference maintenance have been put forward from different perspectives, including cognitive load, communicational demand, and organisation of information (see Hendriks, 2003; Gullberg, 2006 for more discussion).

By contrast, there is some work on L2 learners' use of intonation in encoding given and new information, but not necessarily in the context of reference maintenance. The current study aims to shed new light on L2 learners' use of intonation in reference maintenance by investigating Chinese learners of Dutch at different proficiency levels. The theoretical framework of this study and related literature will be reviewed in the rest of this section.

#### A three-way distinction in information status

According to Chafe (1987), a particular concept (e.g., ideas of objects, events, and properties) in our mind may occur in one of the following different activation states or information states: active or given, semi-active or accessible, and inactive or new. If a referent is already in the addressee's focus of consciousness at the time of utterance, it is considered given. If a referent is still in the addressee's long term memory but is not active in any way currently, it is considered new. If a referent is in the addressee's peripheral consciousness and is not directly focused on, it is considered accessible. A referent can become accessible either by being deactivated from an earlier state or by being inferable from an already active or accessible referent. Lambrecht (1994) refers to these two types of accessibility as 'textually accessible' and 'inferentially accessible' respectively. In addition, he proposes a third type of accessibility, 'situationally accessible', whereby a referent is accessible due to its presence in the text-external world (e.g., the referent of 'waitress' is accessible if mentioned in a restaurant) (Lambrecht, 1994, p. 100).

### Intonation and information status in Dutch

As mentioned above, referents with a lower degree of activation are typically encoded with more intonational prominence than referents with a higher degree of activation. Intonational prominence can be achieved at both the phonological level (i.e., accent placement, type of pitch accent) and the phonetic level (e.g., gradient variation in pitch and word duration). In Dutch, the first mention of a referent is often produced with a longer duration and a wider pitch span than the second mention of the same referent (Swerts, Krahmer, & Avesani, 2002). Chen (2009) conducted a phonetic analysis on word duration and pitch span of referents in different information status conditions. Five native speakers of Dutch were asked to retell Charlie Chaplin's film *A Dog's Life* to an interlocutor. In the film, a vagrant got into trouble with three policemen, who appeared in the same scene one after another. Chen compared the effect of two types of changes in information status: (1) from 'new' to 'given', i.e., between 1st mention of the 1st policeman and subsequent mentions of the 1st policeman; (2) from 'new' to 'accessible', i.e., among 1st mentions of the three policemen. It was found that both givenness and accessibility led to a decrease in word duration, and an increase in accessibility led to more reduction in duration. Further, both givenness and accessibility led to a decrease in pitch span (i.e., difference between the highest and lowest pitch). An increase in accessibility, however, did not lead to a narrower pitch span.

### L2 intonation and information status

Research on L2 intonation has shown that L2 learners frequently use accentuation for both given and new referents (H. Chen, 2008; Gut, Pillai, & Don, 2013). The problem seems to be that L2 learners did not attenuate duration and pitch when a referent was no longer referentially new (e.g., Wennerstrom, 1994, 1998; Verdugo, 2002; Rasier & Hiligsmann, 2007; Rasier, Hiligsmann, Caspers, & van Heuven, 2011). In Chen (2009), she also examined how two untutored Turkish learners of Dutch used intonation at the phonetic level in L2 reference maintenance longitudinally, in comparison to native speakers of Dutch. The learners' nominal referring expressions were elicited following the same procedure as described in the preceding section. Effects of changes in information states (newness vs. givenness, and newness vs. accessibility) on word duration and pitch span were examined. It was found that one learner used word duration to differentiate newness from givenness and accessibility twelve months after his arrival in the Netherlands and used pitch span to distinguish newness from givenness about twenty-two months after his arrival. But neither learner was able to use pitch span to distinguish newness from accessibility. Considering the between-learner differences and the progress one learner made over time, Chen (2009) suggested that learning might play a role in the use of intonation in L2 reference maintenance.

## L2 intonation and language proficiency

Proficiency, typically measured by tests with a focus on vocabulary and syntax, appears to have mixed influences on L2 learners' use of intonation. On the one hand, some studies have shown that proficiency is positively correlated with learners' ability to use intonation appropriately. For example, Swerts & Zerbian (2010) asked Zulu learners of English to produce target phrases such as 'red cow' and 'blue star' in two contrastive conditions (differing in degree of contrastivity) and a third condition involving correction. They found that the proficient L2 learners were able to use intonation appropriately in the contrastive focus conditions, but not in the corrective focus condition, in which they accented both the noun and the adjective across the board. However, the less proficient L2 learners did not use intonation appropriately in any of these conditions. He, van Heuven, & Gussenhoven (2012) examined Chinese speakers' comprehension of Dutch intonation compared to that of native speakers of Dutch. Their results revealed that the high-proficiency Chinese listeners were not native-like but were significantly more accurate in selecting intonation contours appropriate in a given context than the low-proficiency listeners.

On the other hand, other studies have argued that L2 learners' intonational competence does not change much in spite of the fact that the proficiency in other aspects of L2 improves over time (e.g., Verdugo, 2003). For example, H. Chen & Bi (2008) found that Chinese learners of English obtained a better pronunciation at the segmental level but not in terms of intonation, and importantly, there was no correlation between levels of proficiency and degree of appropriateness in the learners' use of intonation in English.

## The goals of the current study

The current study investigates how learners of Dutch with Mandarin Chinese (hereafter Chinese) as their L1 use intonation in reference maintenance in Dutch, compared to native speakers of Chinese and Dutch. The goals are (1) to find out whether the patterns observed in the Chinese learners of Dutch are L1-dependent or L1-independent and (2) to address the question whether proficiency in L2 Dutch matters for the use of intonation in reference maintenance.

## Method

### Participants

Eight native speakers of Chinese with no knowledge of Dutch and nine Chinese learners of Dutch took part in this study. They were paid a small fee for their participation. The native speakers of Chinese were female students or teachers in higher education

(mean age = 28;6). They all passed the Chinese proficiency test (level B or higher) ([http://www.china-language.gov.cn/87/2007\\_6\\_20/1\\_87\\_2635\\_0\\_1182325529609.html](http://www.china-language.gov.cn/87/2007_6_20/1_87_2635_0_1182325529609.html)), and thus qualified for being a teacher of Chinese. The Chinese learners of Dutch included three intermediate learners (mean age = 35) from the University of Delft (as evaluated by their teachers of Dutch) and five advanced learners (mean age = 21;6), who were either engaged in a profession requiring high proficiency in Dutch or lived in the Netherlands since middle childhood.

### Materials

Six picture-stories were composed to elicit three kinds of referents: new (inactive) referents, given (active) referents and accessible (semi-active) referents, following Chafe (1987) and Lambrecht (1994). Three of the picture-stories were adapted from stories used in elementary text books of Chinese. Two were derived from *The Horse Story* and *The Cat Story*, widely used in studies on children's use of referential expressions (Hendriks, 2003). And the sixth one was originally a cartoon story intended as training material for pupils' writing skills in China. The length of the picture-stories ranged from six to ten pages. The pictures were drawn in colour and bound into six story books. A brief text of one or two sentences was composed for each picture in every story in Chinese and was subsequently translated to Dutch. The picture-accompanying texts were printed under the pictures.

The stories contained six target referents referring to five kinds of animals and a person. The target words were 'crow', 'cat', 'horse', 'rabbit', 'monkey' and 'Tom', and appeared in sentence-middle position in the 'new' and 'accessible' conditions, but in sentence-initial position in the 'given' condition. Three of the stories contained accessible referents, such as the concept of 'another horse' (regarded as 'target referent two') in comparison to that of the 'first horse' (regarded as 'target referent one') in *The Horse Story*. Each accessible referent was defined as the 1st mention of target referent two as opposed to a new referent, which was the 1st mention of target referent one. Moreover, a given referent was defined as the 2nd mention of target referent one.

### Procedure

All participants were tested individually. Their task was to read out the six picture-stories at a normal speaking rate and an adequate volume in either Chinese (in the case of the L1 Chinese speakers) or Dutch (in the case of the L2 Dutch speakers). The participants were given some time to familiarise themselves with the texts prior to the reading-out task. The stories were presented to each participant in a randomised order. Each session lasted about 20 minutes. Written instructions were given in the language in which the participants were to read the picture-stories. However, to ensure that intermediate learners could understand the task, a Chinese version of the instructions was provided as well.

The Chinese data were recorded in a sound-proof booth at Nanjing Normal University, China, and the Max Planck Institute for Psycholinguistics (MPI), and the Dutch data were recorded by a portable digital recorder in a quiet room with a 44,100 Hz sampling rate at 16 bit accuracy.

### Phonetic analysis

The recordings of each speaker were phonetically annotated for word boundaries of the target words and the highest and lowest pitch in the target words in Praat (Boersma, 2002), following Chen (2009). Pitch values (Hz) and durations (ms) of the target referents in the three conditions were automatically extracted by Praat scripts.

### Results

The effect of three types of changes in information status was compared in terms of word duration and pitch span in L2 Dutch and L1 Chinese: (1) from 'new' to 'given', i.e., the 1st mention of target referent one vs. the 2nd mention of target referent one; (2) from 'new' to 'accessible', i.e., the 1st mention of target referent one (e.g., 1st horse) vs. 1st mention of target referent two (e.g., another horse); (3) from 'given' to 'accessible', i.e., the 2nd mention of target referent one vs. the 1st mention of target referent two. A small number of tokens of the target words were excluded from analysis because of factors like repetition, self-repair, insertion of an intonational phrase boundary after the target word, and marked speaking rate.

#### Native speakers of Chinese

To assess the effects of different information states (newness, givenness and accessibility) on word duration and pitch span (pitch max – pitch min) in Chinese, mixed-effect models were built in R for each measurement, with information status as the fixed-effect factor, and target word and participant as the random-effect factor (Baayen, 2008). P-values were estimated as posterior probabilities based on Markov Chain Monte Carlo sampling with 10,000 samples at the significance level of 0.05.

#### Duration

The mean duration of the new referents (489 ms, SD = 163 ms) was 107 ms longer than that of the given referents (382 ms, SD = 93 ms) ( $p < 0.001$ ). However, the difference between the accessible referents (374 ms, SD = 93 ms) and the new referents (407 ms, SD = 123 ms) and that between the accessible referents and the given referents

(364 ms, SD = 104 ms) were not statistically significant. This indicated that in Chinese, givenness led to a decrease in word duration, whereas accessibility did not result in consistent changes in the duration of the referent.

### Pitch

The mean pitch span of the given referents (57 Hz, SD = 38 Hz) was 62 Hz smaller than that of the new referents (119 Hz, SD = 73 Hz) ( $p < 0.001$ ), due to a decrease of 63 Hz in the mean pitch maximum ( $p < 0.001$ ). Similarly, the mean pitch span of the new referents (139 Hz, SD = 77 Hz) was 59 Hz wider than that of 1st mentions of the accessible referents (80 Hz, SD = 54 Hz) (marginally significant,  $p = 0.061$ ) due to a significant drop in pitch maximum ( $p < 0.01$ ). This indicated that in Chinese both givenness and accessibility led to a decrease in pitch span, which was caused by a lowering of the pitch maximum. However, there was no significant difference in pitch-related cues between givenness and accessibility, which suggested that an introduction of an accessible referent did not lead to a significant change in pitch compared with that of a given referent. Therefore, accessible referents were treated like given referents regarding pitch.

### Chinese learners of Dutch

#### *Intermediate Chinese learners of Dutch*

*Duration.* The difference in duration failed to reach statistical significance in all three comparisons, indicating that the intermediate Chinese learners of Dutch did not attenuate duration systematically in the given referents or the accessible referents, compared to that of the new referents.

*Pitch.* The mean pitch span of the new referents (78 Hz, SD = 43 Hz) was 25 Hz larger than that of the given referents (53 Hz, SD = 37 Hz) ( $p = 0.076$ ), which was due to a statistically significant lowering of 20 Hz in the pitch maximum ( $p = 0.047$ ). The mean pitch span of the new referents did not differ significantly from that of the accessible referents. This suggested that the intermediate learners consistently varied the pitch maximum to mark the distinction between newness and givenness, but they failed to do so in distinguishing newness and accessibility. Furthermore, the mean pitch minimum of the accessible referents (187 Hz, SD = 22 Hz) was 32 Hz lower than that of the given referents (219 Hz, SD = 28 Hz) ( $p = 0.045$ ). This suggested that accessibility led to a significant drop in the pitch minimum, compared to that of givenness.

#### *Advanced Chinese learners of Dutch*

*Duration.* The mean duration of the new referents (339 ms, SD = 88 ms) was 34 ms longer than that of the given referents (305 ms, SD = 87 ms) ( $p < 0.05$ ). This indicated

that givenness led to a decrease in word duration in the advanced learners. However, there was no significant difference in word duration between new referents and accessible ones or between given referents and accessible referents. This indicated that accessibility did not lead to a significant change in word duration, relative to newness and givenness.

*Pitch.* The difference in the mean pitch span between the new referents (51 Hz, SD = 36 Hz) and the given referents (39 Hz, SD = 31 Hz) approached significance ( $p = 0.08$ ), which was due to a statistically significant decrease of 17 Hz in the pitch maximum ( $p = 0.048$ ). Similarly, the mean pitch span of the new referents (44 Hz, SD = 36 Hz) was 24 Hz larger than that of the accessible referents (20 Hz, SD = 15 Hz) (marginally significant,  $p = 0.056$ ), which was caused by a statistically significant drop of 46 Hz in pitch maximum ( $p < 0.05$ ). This indicated that for the advanced learners, both givenness and accessibility led to a significant drop in the pitch maximum and consequently the pitch span. However, the given referents did not differ significantly from the accessible referents in the pitch-related measures.

### Discussion and concluding remarks

The results described above are summarised in Table 1. As can be seen, Dutch and Chinese are similar in that both givenness and accessibility lead to a decrease in pitch span and givenness also leads to a decrease in duration, compared to newness. These two languages appear to differ in that accessibility leads to a decrease in duration in Dutch but not in Chinese. The difference between givenness and accessibility was not examined for Dutch in Chen (2009). Our results based on read speech suggest that given and accessible referents are not distinguished intonationally in Chinese.

**Table 1.** A summary of results obtained from the three groups of speakers with Chinese as their L1 and native speakers of Dutch from Chen (2009).

Groups	Intonational cues	Newness vs. givenness	Newness vs. accessibility	Givenness vs. accessibility
Native speakers of Dutch	Duration	✓	✓	(not analysed)
	Pitch	✓	✓	(not analysed)
Native speakers of Chinese	Duration	✓	–	–
	Pitch	✓	✓	–
Intermediate chinese learners of Dutch	Duration	–	–	–
	Pitch	✓	–	✓
Advanced chinese learners of Dutch	Duration	✓	–	–
	Pitch	✓	✓	✓

Note: The '✓' = being able to mark a distinction

With respect to the Chinese learners of Dutch, there were noticeable differences in the two groups of learners regarding the use of both duration and pitch-related cues. The advanced learners used the duration cue to mark the change from newness to givenness but not in the two other types of changes, whereas the intermediate learners did not use this cue at all. Furthermore, the advanced learners used pitch-related cues to encode all three types of changes in information status, whereas the intermediate learners did so in two of the three cases. These results clearly point to the positive effect of proficiency on acquisition of L2 intonation, in line with Swerts & Zerbian (2010) and He et al. (2012), but contra Verdugo (2003) and H. Chen & Bi (2008).

Furthermore, the finding that the intermediate learners failed to use duration and used pitch-related cues only to a limited extent, in spite of the striking similarities between Dutch and Chinese, may imply that the main mechanism underlying the learners' use of duration and pitch is not L1 transfer but successful learning in L2, as suggested by Chen (2009). Successful learning in L2 entails that the learners not only have implicit or explicit knowledge of the form-function mapping in L2, but can also implement the mapping in production. Our results show that the advanced learners could implement the uses of pitch and duration in production. However, because the patterns in the advanced learners were quite similar to those in the native speakers of Chinese, we would like to advocate an L1 transfer-based account for the differences between the two groups of learners. The intermediate learners appeared to have benefited from L1 transfer only to some degree. This could be related to two factors. First, the intermediate learners had very limited exposure to Dutch. Consequently they might not have been aware that Dutch and Chinese are similar in the use of intonation in reference maintenance and therefore tried not to do what they would normally do in Chinese. Second, the reading-aloud task might be too demanding for the intermediate learners because of their small vocabulary and limited understanding of Dutch syntax. As a result, they could be overloaded with just reading out the words in each story clearly, failing to take the discourse structure into account in their reading.

Finally, the Chinese learners of Dutch could use pitch earlier than duration, differing from the Turkish learners of Dutch who could use duration earlier than pitch (Chen, 2009). This suggests that there is no L1-independent pattern in the acquisitional order of pitch and duration as cues to referential givenness-newness. We do not know what could have caused this difference between these two groups of Dutch learners. We might, however, speculate that the Chinese learners of Dutch were more sensitive to pitch than the Turkish learners of Dutch, because pitch is used both at the lexical and post-lexical level in Chinese, whereas pitch is primarily used at the post-lexical level in Turkish (Zimmer & Orgun, 1999).

### Future research

The current study is small in scale due to the relatively small number of L2 Dutch learners involved. However, it does provide a first insight into how Chinese learners of Dutch use intonation in reference maintenance in Dutch. The current results can thus serve as a starting point for large-scale studies investigating L1-dependent and L1-independent strategies in the use of intonation in reference in Chinese learners learning different L2s and in learners of Dutch with different L1s. Furthermore, the current study is concerned with read speech. It has been shown that native speakers of German use intonation in reference differently in read speech and spontaneous speech (De Ruiter, 2010). Little is known on the role speaking modality can play in L2 learners' use of intonation. Future research is needed in this area.

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