

The perception of interrogativity by Japanese speakers of Dutch as a second language

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1. Introduction

There are several linguistic tools for marking a specific message as a question: syntax (word order), prosody (question intonation) and lexis (question words or particles). When learning a second language, differences in question marking between first and second language may in principle be a problem for the correct perception and production of interrogativity in the second language. In Japanese there is no difference in word order between yes/no questions and statements: a statement is turned into a yes/no question by adding the sentence-final question particle *ka*. Given that second-language learners may transfer elements of their mother tongue to the second language, we predict that Japanese speakers of Dutch may have problems with interpreting Dutch questions that are marked only by inverted word order.

2. Questions in Dutch

In Dutch there are a number of linguistic cues available for marking a speech utterance as a question. The canonical yes/no question has inversion of subject and finite and is marked by question intonation (i.e., a high tone at the end of the utterance): *Eten koeien gras?* ‘Do cows eat grass?’. Furthermore, there are Wh-questions, starting with a Wh-word and marked by a high utterance-final tone in the majority of cases: *Wat eten koeien?* ‘What do cows eat?’. Finally, sentences with a straight word order (i.e., statements) may be changed to a question

by uttering them with a question intonation: *Koeien eten gras?* ‘Cows eat grass?’. In addition, the sentence-final particle *hè* can be added to a statement, which results in a specific type of question (an acknowledgment question), typical of informal speech: *Koeien eten gras, hè?* ‘Cows eat grass, don’t they?’ (Haan 2002, Haan and Van Heuven 2003, Kirsner and Van Heuven 1996).

Using a corpus of play-acted speech materials Haan (2002) has shown that the number of question-marking high boundary tones (H%) is highest when there are no syntactic (inversion) or lexical (question word) cues to interrogativity. Declarative questions receive a melodic marking in 100% of the cases, since the melodic cue is the only way to distinguish it from a statement. For yes/no questions and Wh-questions the role of question intonation is less crucial in signaling interrogativity, because of the lexico-syntactic markers that are present in the utterance. “We may speculate that, in WQ [Wh-questions] and YQ [yes/no questions], the main function of the category H% [utterance final high pitch] is to make the utterance sound more prototypically questioning, not to signal questionhood *per se*, given that this latter purpose is already served by question word and/or inversion.” (Haan 2002: 151).

3. Questions in Japanese

In Japanese, yes/no questions are not formed by altering the word order of a statement, but by adding the question particle *ka*: *Jan wa Nihongo wo hanasu* ‘Jan speaks Japanese’ is a statement, while *Jan wa Nihongo wo hanasu ka?* ‘Does Jan speak Japanese?’ is a yes/no question. There are no quantitative studies available on the melodic marking of questions in Japanese, but there is consensus on the view that questions are normally produced with sentence-final rising intonation. A perception study has shown that questions (i.e. sentences ending with *ka*) without such a sentence-final rise are not perceived as interrogative (Niioka 2004), which indicates that Japanese questions are obligatorily marked by question intonation. In stead of using the sentence particle *ka*, statements may be turned into questions by using question intonation only, as in Dutch: *Jan wa Nihongo wo hanasu?* ‘Jan speaks Japanese?’.

With respect to declarative questions, the Dutch and Japanese systems converge, but there are differences between the two languages with respect to yes/no questions: Japanese yes/no questions have a lexical (*ka*) and a melodic marker, while Dutch yes/no questions have a *syntactic* (inversion) and a melodic marker. The Dutch questions ending in a particle (*hè*) differ from the Japanese questions with respect to the function of the utterances: a request for

acknowledgement ('yes' is the expected reply) versus a 'real' question ('yes' and 'no' responses are equally likely, see further Haan and van Heuven 2003).

4. Transfer

Dutch is a Germanic language, while Japanese is most likely part of the Altaic language family. The two languages differ in all linguistic domains, including prosody. For example, Japanese is a so-called pitch-accent language, while Dutch is a language with lexically determined stress, and focus-related pitch accent location. This means that pitch features are only postlexical in Dutch (i.e., not part of the lexical specification of words), while in Japanese, pitch features are specified in the lexicon, with the exception of edge tones (Ladd 1996). Moreover, pitch accents are used in Dutch, but not in Japanese, to mark focus and differences in pragmatic meaning at the sentence level (Venditti 2005, Pierrehumbert and Hirschberg 1990).¹

Research on the influence of the first language (L1) on acquisition of a second language (L2) has shown that at least beginning speakers may transfer aspects of the structure of their L1 to the L2 (for an overview see Odlin 2003, for specific studies related to Dutch see e.g. Jansen, Lalleman and Muysken 1981, Van den Berg 1995, Schouten 1996 and Van de Craats 2000). Research on the transfer of prosodic aspects of the L1 is relatively sparse, but the available studies support the view that the prosodic organisation of the L1 influences the production and perception of prosodic aspects of the L2 (Wennerstrom 1994, Munro and Derwing 1995, Dupoux, Pallier, Sebastián-Gallés and Mehler 1997, Chun 2002).

Assuming that, in principle, all linguistic domains may be involved in transfer from L1 to L2, it is conceivable that aspects of Dutch questions are problematic for Japanese learners of Dutch as a second language (DSL). These, then, would be instances of negative transfer from Japanese to the learning of DSL.

5. Research questions and approach

In the present paper, then, we ask: (1) Is the inversion of subject and finite in Dutch as a question marker a problem for Japanese learners of DSL and (2) what is the role of intonation in the perception of inversion questions (i.e. yes/no questions) for DSL listeners?

Ten native speakers of Dutch and ten Japanese speakers of DSL judged Dutch utterances on a scale from 1 ‘not at all questioning’ to 5 ‘very questioning’. Word order, presence versus absence of sentence-final question intonation and sentence-final particle (*hè*) were systematically varied, omitting ungrammatical combinations of inversion and particle (**Spreekt Jan Japans, hè?*, *‘Does Jan speak Japanese, doesn’t he?’). The particle *hè* was included in the experiment so as to create a condition in which Dutch questions are structurally similar to Japanese, albeit that Dutch *hè* and Japanese *ka* do not have the same function.

The following types of stimuli were used in the experiment (the question mark indicates the presence of a sentence-final high pitch, or H%, a full stop indicates final lowering of pitch, or L%):

Non-prosodic cues		final boundary tone	
Word order	particle	high (H%)	low (L%)
inverted	–	(1a) <i>Spreekt Jan Japans?</i>	(1b) <i>Spreekt Jan Japans.</i>
straight	–	(2a) <i>Jan spreekt Japans?</i>	(2b) <i>Jan spreekt Japans.</i>
straight	<i>hè</i>	(3a) <i>Jan spreekt Japans, hè?</i>	(3b) <i>Jan spreekt Japans, hè.</i>

In a second part of the experiment the same stimuli were presented to the subjects again (in a different order), this time asking for acceptability judgments on a scale from totally unacceptable (1) to highly acceptable (5). This was done to be able to assess the relative acceptability of all combinations of syntactic, lexical and melodic markers present in the stimulus materials. Note that the subjects’ task was to judge the acceptability of the utterance per se, not the acceptability of the utterance as a question.

We hypothesized that Japanese speakers of DSL will not perceive inversion sentences without question intonation (1b above) as interrogatives, in contrast to the Dutch native speakers, who will perceive such utterances as questions, albeit somewhat less convincingly so than inversion sentences with question intonation. There were no clear expectations with regard to the classification of stimuli ending in *hè* by the Japanese subjects, since this particle is typical of spontaneous speech and does not commonly appear in Dutch foreign language courses — in contrast to the use of syntactic inversion as a question marker — so that the Japanese subjects may not know what this particle signifies.²

As for acceptability judgments of the stimuli, the Dutch subjects were expected to judge the utterances ending in *hè* as unacceptable, if these do not feature the question-marking pitch rise at the end (cf. Kirsner and Van Heuven 1996).

5. Method

Materials. The following three sentences were used in the experiment:

- | | | |
|-------|-----------------------|---------------------|
| (i) | Jullie leren Engels | ‘You learn English’ |
| (ii) | Jullie hebben olijven | ‘You have olives’ |
| (iii) | Jullie komen | ‘You come’ |

The sentences largely contained voiced segments, to be able to evaluate the produced pitch curve properly. Secondly, we tried to construct sentences that are not easily interpreted as imperatives; one type of imperative in Dutch (the adhortative) has the same syntactic make-up as yes/no questions.³

The word order of the sentences was varied (inverse vs. straight), and the particle *he* was added to the straight versions, and all resulting sentences were pronounced with and without a sentence final pitch rise, twice, in a sound insulated booth by a trained female speaker of Dutch. The resulting 36 utterances were recorded through a Sennheiser MKH416 unidirectional condenser microphone on digital tape. The recordings were downsampled to 16 kHz (16 bit) and stored on hard disk. The intonation contours were checked for irregularities using Praat (Boersma and Weenink 2004).

Subjects and procedure. All ten Japanese subjects lived in the Netherlands at the time the experiment took place. The proficiency in Dutch of the subjects varied from elementary to highly advanced as a result of (i) the length of their residence in the Netherlands (from 2 to 9 years), of (ii) the education they had had in Dutch (from an introductory course of three weeks to a five-year curriculum at the department of Dutch Studies at Leiden University), and of (iii) the fact whether they spoke Dutch on a regular basis (most of the subjects did not, but often used English as a *lingua franca*). The diversity of the subjects was inevitable as the number of Japanese speakers of DSL available was limited. Five male and five female native speakers of Dutch were selected for the control group.

The subjects took part in the experiment in individual sessions. When necessary, Japanese subjects were explained the meaning of the words occurring in the experimental sentences. The stimuli were presented via a self-paced Power-Point presentation on a laptop computer with a loudspeaker attached; the scores were collected on written answer sheets. For each stimulus two buttons appeared on the screen: one labeled ‘listening’ and the other labeled ‘continue’. The subjects could summon each stimulus more than once. Half of the subjects received the 36 stimuli in one order and the other half in the reversed order.

6. Results

Question scores. Figure 1 presents the mean question scores for the stimuli with and without a final pitch rise for the two groups of subjects.

In addition to significant main effects of L1 ($F_{(1,718)} = 3.9, p < .05$) and intonation ($F_{(1,718)} = 321.6, p < .001$), there is a significant interaction between the two factors ($F_{(1,716)} = 10.6, p < .005$): the Japanese and Dutch subjects perceive the stimuli with rising final intonation as equally questioning, but the Japanese

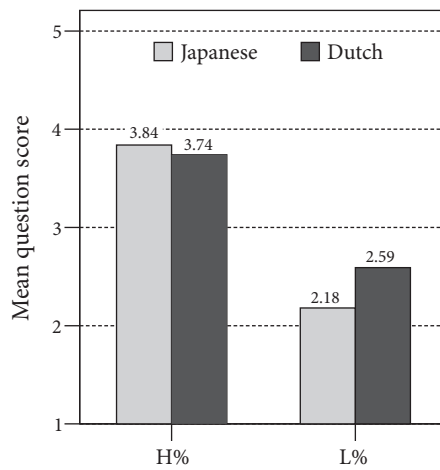


Figure 1. Mean question score for utterances with (H%) and without (L%) question intonation, broken down by L1 (Japanese vs. Dutch)

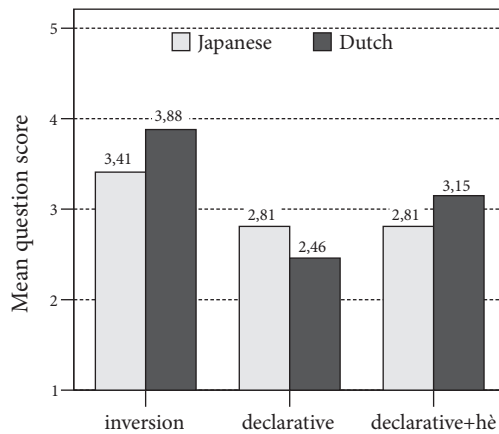


Figure 2. Mean question score per sentence type, broken down by L1 (Japanese vs. Dutch).

subjects perceive the falling final intonation as less questioning than the Dutch subjects, probably as a result of the fact that they attach more weight to intonation than to syntactic (straight ~ inversion) and lexical cues (with ~ without *hè*) to interrogativity.

Figure 2 contains the mean question scores for the three types of sentence (inverse word order, declarative, declarative plus sentence-final particle *hè*), broken down by L1.

There is a significant effect of sentence type on the question scores ($F_{(2,717)} = 57.5$, $p < .001$), and a significant interaction with L1 ($F_{(2,714)} = 10.6$, $p < .001$). Inversion sentences sound more questioning to Dutch subjects than to Japanese subjects, straight-order sentences sound more questioning to Japanese than to Dutch subjects, and the straight-order sentences plus *hè* are more questioning to the Dutch than to the Japanese subjects. For the native speakers the differences in interrogativity between the three sentence types are more outspoken than for the non-native group, which can be explained by the fact that the lexico-syntactic differences between the sentence types are less well known by the DSL speakers.

No significant three-way interaction between the factors intonation, L1 and sentence type was found. However, when the factor sentence type is recoded from three levels to two, grouping together the straight-order sentences with and without the final particle *hè*, a significant three-way interaction is found between sentence type, intonation and L1 ($F_{(1,714)} = 4.2$, $p < .05$). Figure 3 presents the effects of intonation, sentence type (inversion vs. no inversion) and L1 on the mean question scores.

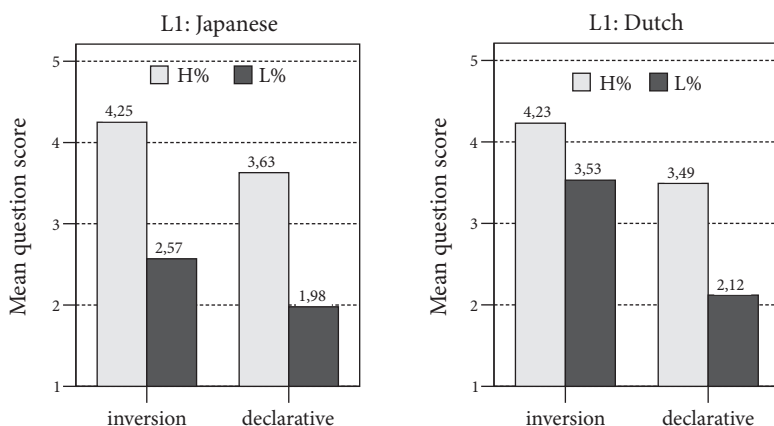


Figure 3a and b. Mean question score for inverted and straight sentences, broken down by question intonation (H% vs. L%), separately for Japanese (a) and Dutch (b) subjects.

Focusing on the data of the Japanese subjects, two additive effects are visible: sentence type and intonation; inversion sentences are more questioning than straight-order sentences, and utterances ending in a pitch rise are (much) more questioning than utterances ending in a pitch fall. For the Dutch subjects, however, a more complex picture emerges: for inversion sentences the effect of intonation is relatively small, while the question scores for the declarative sentences depend much more strongly on the presence of a final pitch rise.

DSL speakers were classified post hoc as one beginning (< 1 month of Dutch courses), seven intermediate (3–6 months of courses) and two advanced learners (> 12 months of courses). Closer inspection of the group of Japanese subjects reveals an interesting influence of L2 proficiency on the question scores (the findings cannot be supported by statistical analyses because of the small number of subjects per cell).

Looking first at the inversion sentences (Figure 4a), we observe that the beginning speaker of Dutch does not really differentiate, but assigns scores around the neutral middle of the scale, arguably because he does not recognize the inversion construction. The group of intermediate subjects shows a large effect of intonation: rising final pitch leads to question responses, falling final pitch to non-question responses, which means that they do not recognize the inverted word order as an independent cue to interrogativity. The advanced DSL speakers judge the stimuli as the Dutch subjects do: inversion sentences

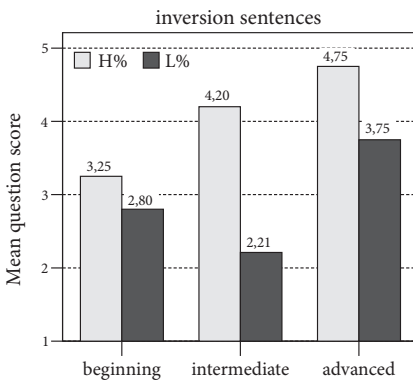


Figure 4a. Mean question scores of Japanese subjects for inversion sentences per proficiency level (beginning, intermediate and advanced), broken down by question intonation (H% vs. L%).

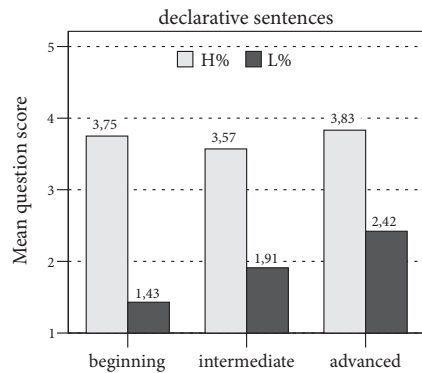


Figure 4b. Mean question scores of Japanese subjects for declarative sentences (with and without *hè*) as a function of proficiency level (beginning, intermediate and advanced), broken down by question intonation (H% vs. L%).

with question intonation are perceived as very questioning, while inversion sentences with statement intonation are also perceived as questions, albeit less strongly so.

For the sentences with straight word order (Figure 4b) the picture is different, but again a clear development is visible: for all three groups the declarative sentences with rising final intonation are moderately questioning. The perceived question status of the stimuli with final low intonation rises with the proficiency of the speakers, probably as a result of the fact that the subjects have begun to realise that *hè* marks interrogativity in Dutch.

Acceptability scores. Figure 5 presents the mean acceptability scores. Since there are no significant effects that involve the factor L1, the data are collapsed over the two groups of subjects.

Sentence type and intonation have significant effects on the acceptability scores ($F_{(2,717)} = 6.9, p < .005$ and $F_{(1,718)} = 57.7, p < .001$, respectively), and there is a significant interaction between the two factors ($F_{(2,714)} = 14.1, p < .001$). Inversion sentences are more acceptable than straight-order sentences (a posthoc analysis shows only two groups) and utterances with question intonation are perceived as more acceptable overall than utterances with statement intonation, probably as a result of the fact that most stimuli are lexico-syntactically marked as questions. With respect to the interaction, there is a clear difference between the declarative utterances and the other two sentence types: for the bare statements (e.g., *Jullie hebben olijven*, 'You have olives'), there is no difference in acceptability depending on sentence-final intonation, which means that a 'normal' statement (without question intonation) is as acceptable as a

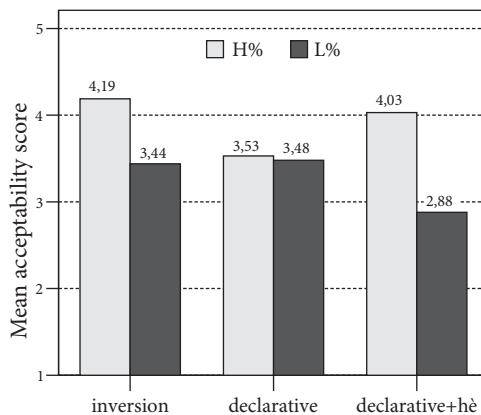


Figure 5. Mean acceptability scores per sentence type, broken down by question intonation (H% vs. L%).

declarative question (same sentence with question intonation). For the other two sentence types the situation is different: an inversion sentence is more acceptable with question intonation than without; for stimuli ending in *hè* this effect is even larger. Therefore, utterances with lexico-syntactic interrogativity cues are more acceptable with question intonation than without it.

7. Conclusion

The results indicate the following:

- inversion of subject and finite with question intonation signals question status for both native and DSL speakers
- as predicted, inversion sentences without question intonation are not perceived as questions by the DSL subjects and as moderately questioning by the native speakers
- inversion sentences without question intonation are acceptable to both groups of speakers (but DSL speakers may consider these utterances as statements)

The Japanese DSL speakers assign more weight to intonation when determining the interrogativity of an utterance than the Dutch subjects do. This suggests transfer from intonational function from L1 to the L2, especially for the intermediate learners. The syntactic cue to question status in Dutch (inversion) is not recognized by all subjects, indicating that this aspect of Dutch grammatical structure has not been acquired yet. There is no evidence for transfer of the function of the question particle *ka* to the Dutch particle *hè*, since the declarative sentences with and without *hè* are perceived as equally questioning by the DSL subjects (the utterances with *hè* and question intonation receive a mean score of only 3,3). This indicates that the Japanese subjects do not regard *hè* as a Dutch version of *ka*. That the meaning of *ka* is not transferred to *hè* may be due to the fact that Japanese has many particles, which renders transfer of a single specific function unlikely, and/or to the fact that *hè* is colloquial in Dutch, but Japanese *ka* may also be used in formal language. Transfer of particle functions is further discouraged by the circumstance that Dutch, too, has a fair number of (sentence-final) particles, the meaning and function of which are highly obscure and notoriously difficult to master as a foreign learner.

Our data suggest that the perception of cues to interrogativity in Dutch improves gradually, which means that DSL speakers learn to pick up the different

relevant cues over time. This may be taken in support of the view that natural L2-acquisition eventually leads to — implicit — knowledge of the L2. It would be very interesting to investigate whether, and if so how, this process may be accelerated by providing the DSL learners with rules for marking question status.

Notes

1. Pierrehumbert and Hirschberg make the claim for English rather than Dutch. We know, however, that English and Dutch use pitch accents and the variation of their shapes in the same way (Gussenhoven 1984, Caspers 2000).
2. It was verified post hoc whether the Japanese subjects knew the meaning of the particle *hè*; seven of the ten subjects indicated they did not know its meaning. All Japanese subjects had been taught the use of syntactic inversion as an interrogative marker as part of their DSL education. Intonation was never taught explicitly in the Dutch courses to DSL speakers.
3. *Leren jullie Engels* and *Komen jullie* can in fact be interpreted as imperatives, in contrast with *Hebben jullie olijven*. However, post-hoc analyses of our materials do not reveal a significant effect of sentence type. Therefore we rule out the possibility that our subjects ever entertained an imperative reading of the stimuli.

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