The use of intonation in online processing of information status in a second language

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English native listeners can rapidly map intonation to information status in reference resolution (e.g. Dahan et al. 2002, Chen et al. 2007, Ito and Speer 2007, Watson et al. to appear). Chen et al. (2007) found that native listeners associated L*H and deaccentuation with givenness and H*L and L*HL with newness in British English. The present study investigates nonnative processing of information status signaled by intonation in Dutch learners of British English at low- vs. high- proficiency levels (senior high school pupils vs. 3rd-year English majors).

The limited work on nonnative processing of intonation suggests that abilities in processing intonation may get carried over from the native language to a prosodically similar nonnative language (Akker and Cutler 2003). Dutch and English are similar in marking a new referent most frequently with H*L and a given referent with deaccentuation when the referent is the only new entity in the sentence. They differ in that Dutch marks a new referent most frequently with L*H but English with H*L when the referent is one of the new entities in the sentence (Braun and Chen 2007), like the stimuli in the present experiment. Assuming L1 transfer, we expected Dutch learners of English, the low-proficiency learners in particular, to associate H*L and L*H with newness and deaccentuation with givenness in English.

We adopted the eye-tracking paradigm used by Dahan and colleagues to test this prediction. Eye fixations were recorded as participants followed instructions in British English and moved objects in a visual display. Each trial included two instructions (e.g. *Put the window/windmill above the triangle; now put the window below the circle*). The second instruction mentioned the target (*window*), realized with H*L, L*H or deaccentuation. The first instruction mentioned either the target or the competitor (*windmill*), determining the information status of the target and competitor in the second instruction, as illustrated in Table 1. The referent mentioned in the first instruction was considered 'given' in the second instruction; the referent not mentioned in the first instruction was considered 'new' in the second instruction. Fixations during the ambiguous part of the target word (/wɪn/) are the dependant variable that reflects listeners' processing of intonation. Because the names of a majority of the objects were not taught at school, we familiarized the pupils (i.e. the low-proficiency learners) with the words and the pictures two weeks preceding the experiment. This was done to minimize the risk that they could not respond to intonation simply due to a failure to recognize the words and map them onto the pictures.

We found that both proficiency groups fixated the referents substantially more frequently when 'given' than when 'new' regardless of intonation. Thus, unlike English native listeners (Chen et al. 2007), L2 learners were biased towards what they moved before and made no use of intonation in processing the information status of the upcoming referent.

However, L2 learners fixated the 'given' referent to different degrees in different accent conditions. Fixations to the 'given' competitor showed that the low-proficiency learners associated both L*H and deaccentuation with givenness, similar to English native listeners, whereas the high-proficiency learners associated only deaccentuation with givenness, as may be predicted from L1 transfer. Possibly, the extra processing load with mapping words onto pictures may have made the high-proficiency learners fall back on L1 intonation. Equally possible is the hypothesis that the low proficiency learners make more use of intonational information whereas the high-proficiency learners lexical information in instructed visual search tasks. A separate test with a different group of advanced Dutch learners of English

who are familiarized with the words and the pictures can shed light on this perplexing group difference.

Fixations to the 'given' target revealed strikingly different patterns. H*L and L*H triggered more fixations than deaccentuation in the low-proficiency learners and H*L triggered more fixations than L*H and deaccentuation in the high-proficiency learners. It is not obvious how to best explain these results. We considered the possibility that intonational information may be processed only when the acoustic information disconfirmed L2 learners' initial bias as to which referent was the upcoming referent. The ambiguous part of the target word was acoustically 'highlighted' in the accented conditions (i.e. H*L and L*H) such that the recognition of the target word became easy. L2 learners' initial bias towards the 'given' target was thus confirmed. This in turn led to more fixations to the 'given' target. On the other hand, in the 'given' competitor condition, the highlighting of the acoustic information of the ambiguous part suggested that the upcoming referent was the target, which was the new entity. This went against L2 learners' initial bias towards a 'given' referent, i.e. the 'given' competitor. They then turned to the intonation, which suggested the 'given' competitor to be the upcoming referent in the L*H and deaccentuation conditions. Further, as L*H is acoustically less prominent than H*L, the extra processing load of mapping words onto pictures might wash out the word recognition advantage in the accented target words in the high-proficiency listeners.

Our results thus show that Dutch learners of English are less efficient than English native listeners in processing the mapping of intonation to information status in English. However, they appear to be able to map intonation to information status in a native-like way in exceptional circumstances: (1) free from extra processing load and (2) the acoustic information of the segments does not match with their initial bias. Unexpectedly, a higher level of overall proficiency in L2 does not entail a more efficient use of intonation. Future work is needed to obtain a clearer picture on the unexpected difference between the two proficiency groups.

Table 1. Illustration of experimental conditions.

First instruction	Second instruction	Information status
Put the *windmill* above the triangle (competitor)	Now put the *window* below the circle. (target)	New target Given competitor
Put the *window* above the triangle (target)	H*L L% ..L*H H% deaccentuation L%	Given target New competitor

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