

Prosodic processing in sentences with “only” in L1 and L2 English: An ERP study

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Speakers of West Germanic languages use focus particles such as “only” to signal upcoming contrast but can differ in the exact manner. For example, English speakers prefer placing “only” adjacent to the verb and indicate the locus of contrast via accentuation (e.g. I have only carried the bag vs. I have only carried the bag) [1]. In contrast, Dutch speakers prefer placing “only” (“*alleen*”) adjacent to the contrastive, accented word [2]. Such cross-linguistic differences imply that Dutch and English listeners may use different processing strategies in their brain in sentences with “only” in their native language (L1). It has been shown that Dutch listeners expect accentuation immediately following “*alleen*” in online processing (early positivity at 100-200ms, followed by an “accent positivity”) [3]. When they hear accentuation further away from “*alleen*”, expectation (Expectancy Negativity) and sentence reanalysis (P600) occur. Furthermore, linguistic context speeds up the recognition of accentuation (shorter latency of “accent positivity”) [4]. However, nothing is known on the brain’s response to sentences with “only” in L1 English listeners and Dutch learners of English (L2 English). The present study aims to find out whether L1 and L2 English listeners exhibit different expectancy patterns of accentuation when processing English sentences with “only”. Dutch listeners may experience L1 influence when processing L2 English prosody [5] or use learner-specific approaches that do not resemble L1 Dutch or English processing [6]. We hypothesize that L1 and L2 English listeners process accentuation immediately following “only” similarly but accentuation not adjacent to “only” differently, and that presence of context will enhance these differences.

Methods: Advanced Dutch learners of English (n=33, 14m) and native English listeners (n=8, 2m, more being tested) listened to four types of English stories (60 per type), differing in the presence/absence of context and accentuation on verbs/objects (Table 1). ERPs were recorded from the onset of verbs and objects (t=0) to 1000ms afterwards. We conducted mixed effect analyses using R (lme4) for verbs and objects separately in three time windows, depending on the respective word length (Figure 1), with ACCENT (verb, object), CONTEXT (absent, present), ANTERIORITY (front, central, back), LATERALIZATION (right, middle, left), and GROUP (Dutch, English) as fixed factors and PARTICIPANT as the random factor. Pairwise comparisons were done with Bonferroni correction.

Results – Verbs: In 100-200ms after verb onset, we found significant interactions of ACCENT x ANTERIORITY and ACCENT x CONTEXT. Pairwise comparisons revealed that accentuation was recognized early (more positivity) than deaccentuation in frontocentral brain regions and context elicited an expectancy response (more negativity) only when the verbs were deaccented. In 200-390ms, we found a significant interaction of ACCENT x ANTERIORITY x GROUP. Pairwise comparisons revealed that the acoustic properties of accentuation were processed with more positivity across the whole scalp by L2 listeners but not by L1 listeners.

Results – Objects: In contrast to verbs, we found neither a significant main effect of ACCENT nor significant interactions involving ACCENT in 100-200ms and in 200-390ms after object onset, suggesting that early processing was not guided by contrast or prosody. In 500-900ms, we found significant interactions of ACCENT x ANTERIORITY and CONTEXT x ACCENT x GROUP. Pairwise comparisons revealed that accentuation made sentence reanalysis more effortful (more negativity) in frontocentral regions than deaccentuation for L2 listeners, independent of context, but for L1 listeners only when the context was absent.

Discussion & Conclusion: In spite of showing a stronger response to the acoustic properties of accentuation, L2 English listeners processed accentuation in the verb similarly to L1 English listeners. Both groups were similar to L1 Dutch listeners in [7]. This can be explained by the fact that it is common to accent the verb immediately following “only” in both Dutch and English. Interestingly, accentuation in the object made sentence reanalysis more effortful for L2 listener with or without context, but for L1 listeners only in the absence of context. These findings can be

explained by influence from Dutch in processing L2 English sentences, in particular, the expectation of an accented word right after “only” and the markedness of sentences with “only” and with the object accented without any context. To conclude, our hypotheses are largely borne out by the initial results. L2 English processing is influenced by processing strategies in L1 Dutch even in advanced Dutch learners of English. Additional data from L1 English listeners will help to verify our current conclusions.

Table 1. Examples of experimental stimuli. Pitch accents are represented in bold.

Context sentences	Target sentences	
The dinosaur has a pumpkin and a bucket.	(A) The dinosaur is only	(B) The dinosaur is only
He was going to throw them and kick them.	throwing the bucket.	throwing the bucket .
Then he changed his mind.		
-	(C) The dinosaur is only	(D) The dinosaur is only
	throwing the bucket.	throwing the bucket .

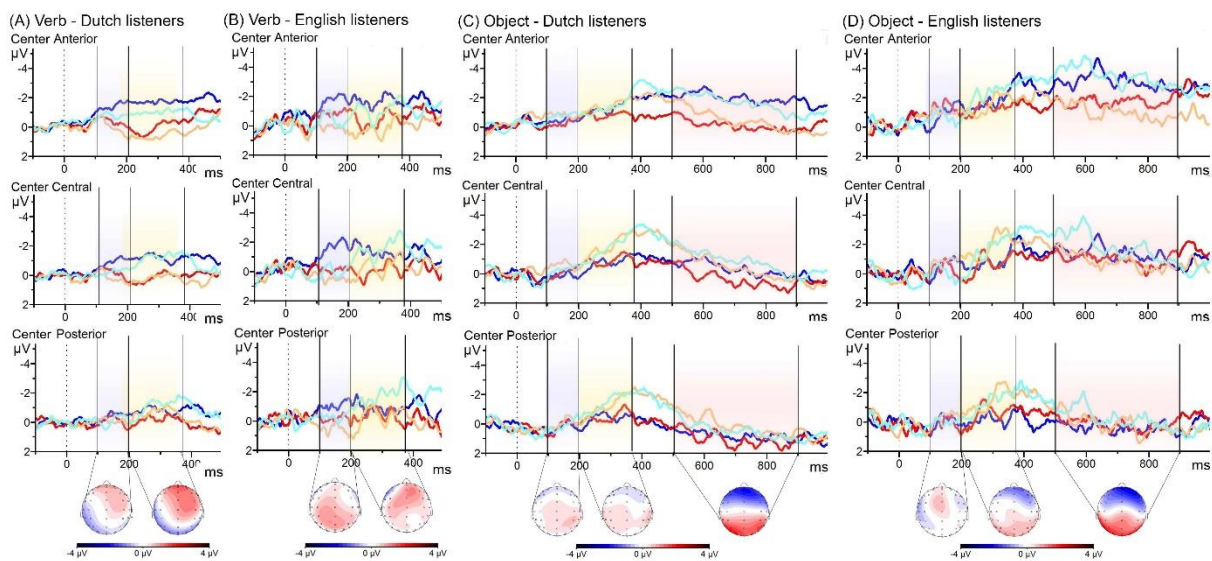


Figure 1. Grand-average ERPs for verbs in L2 (A) and L1 English listeners (B), and objects in L2 (C) and L1 English listeners (D) from word onset ($t=0$). Baseline correction was performed in the 100ms prior to word onset. Conditions: accented verbs with context (red) and without context (orange), and accented objects with context (dark blue) and without context (light blue). Vertical lines indicate time windows. Topographies reflect accent effects (accented–deaccented). The time window of 500ms till 900ms in verbs was not analysed as this overlapped with the onset of words after the verbs.

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