Morphological priming in Turkish: Evidence from heritage speakers

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Previous research has shown that heritage speakers (HS) struggle with inflectional morphology particularly with irregular forms [1, 2, 3]. The notion of 'limitations of online resources' for processing in a non-dominant language has been claimed as one possible reason for these difficulties [3]. According to this notion, HS should show resistance to irregularity and rely more on regular forms in language production and may be expected to process irregular forms less efficiently compared to regular forms (i.e. smaller priming effects for irregulars). In addition, HS are supposed to draw on knowledge from other non-grammatical resources (i.e. semantic and/or orthographic) as a result of their limited online resources when operating in their heritage language. To date, however, there is very little experimental evidence on real-time language processing in HS to investigate this recently proposed notion [4].

Here we report results from a masked priming experiment with 97 bilingual (Turkish/German) HS and a control (CTR) group of 40 monolingual speakers of Turkish examining the Turkish aorist. In addition to the two morphological conditions, namely regular and irregular aorist, orthographic and semantic conditions were included in the design as control conditions (see Table 3). We employed the visual masked priming technique with an SOA of 50 ms because this method has been argued to be sensitive to morphological cues for visual word recognition and lexical access. In addition to the measures of priming magnitudes, a measure of variability by group and condition was also included for the analysis.

The results of the priming magnitudes revealed that the HS and the CTR speakers performed alike for the morphological conditions, exhibiting significant priming both for regular and irregular aorist (see Table 1 and 2). However, while the CTR group showed genuine morphological priming, signified by significant priming in the morphological but not in the orthographic and semantic control conditions, the HS group exhibited priming in both the morphological and the semantic conditions.

We also explored the inter-individual variability of the priming effects for the two participant groups by subtracting the log-transformed RTs for the related primes from the log-transformed RTs for the unrelated primes, separately for the two morphological and the two control conditions for each individual participant. Based on the results of Levene's tests, HS showed significantly more variability than the CTR group for the irregular (F = 4.206; p = 0.042) and semantic (F = 5.563; p = 0.019) conditions but not for the regular (F = 0.048; p = 0.827) and orthographic (F = 2.454; p = 0.120) conditions.

To account for these findings, we argue that for the regular aorist, HS use the same morphological decomposition mechanism ('affix stripping') as CTR speakers. For processing irregularly inflected word forms, however, (at least some) HS recruit additional (possibly morpho-semantic) processes as reflected in significantly more inter-individual variability than amongst the CTR group [5].

We conclude that HS use the same decompositional mechanism for regular morphology as CTR speakers, whereas for irregular morphology they additionally rely on semantic relatedness. These findings support the notion of 'limitations of online resources' for HS when processing in their non-dominant language.

References:

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Table 1. HS Results

Fixed Effects	Estimate	Std. Error	t value
(a) HS Irregular			
Intercept	6.379	0.022	290.604*
Prime Type (Related vs. Unrelated)	-0.034	0.010	-3.437*
(b) HS Regular			
Intercept	6.392	0.020	322.330*
Prime Type (Related vs. Unrelated)	-0.040	0.009	-4.330*
(c) HS Orthographic			
Intercept	6.463	0.027	240.190*
Prime Type (Related vs. Unrelated)	-0.009	0.013	-0.710
(d) HS Semantic			
Intercept	6.441	0.023	278.458*
Prime Type (Related vs. Unrelated)	-0.022	0.009	-2.407*

Table 2. CTR Results

Fixed Effects	Estimate	Std. Error	t value
(a) CTR Irregular			
Intercept	6.364	0.033	191.358*
Prime Type (Related vs. Unrelated)	-0.028	0.014	-1.946*
(b) CTR Regular			
Intercept	6.362	0.027	239.677*
Prime Type (Related vs. Unrelated)	-0.032	0.015	-2.140*
(c) CTR Orthographic			
Intercept	6.369	0.029	218.170*
Prime Type (Related vs. Unrelated)	-0.012	0.018	-0.660
(d) CTR Semantic			
Intercept	6.383	0.025	259.263*
Prime Type (Related vs. Unrelated)	-0.002	0.012	-0.207

Turkish aorist and materials

The Turkish aorist encodes habitual aspect or general present tense. The irregular forms are only observed in the monosyllabic consonant-ending verbs. Monosyllabic verb stems ending with a consonant are most commonly suffixed with *–Ar* (*-ar, -er*) based on the vowel harmony, e.g. *kes-er* “cuts”, *sor-ar* “asks”. There are 13 highly frequent monosyllabic verb stems that are exceptional in their aorist form in that they require the suffix *–Ir* (*-ır, ir, -ur, -ür*) again based on the vowel harmony instead of the regular *–Ar*, e.g. *gör-ür* “sees”, *var-ır* “arrives”. Thus the irregularity in this particular case arises from an existing suffix exceptionally applied to a limited unpredictable set of monosyllabic stems.

Two morphological priming conditions include one with regular and the other with irregular aorist forms of monomorphemic verbs as primes. Two control conditions were added to the design. The orthographic control priming condition has the same word-initial orthographic overlap as the morphological conditions. The semantic control condition had prime-target pairs that were semantically related but morphologically and orthographically unrelated.

Table 3 provides an example of the materials used in the experiment.

Table 3. Materials

	Related Prime	Unrelated Prime	Target
Regular	*duyar* “hears”	*bekle* “wait”	*DUY* “hear”
Irregular	*gelir* “comes”	*zaman* “time”	*GEL* “come”
Orthographic	*devre* “period”	*üslup* “style”	*DEV* “giant”
Semantic	*kafa* “head”	*merkez* “center”	*BAŞ* “head”