Turkish Morphology Acquisition:
A comparative analysis of L1 and L2 acquisition processing models

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Abstract

Linguistics researchers have long debated whether to store morphological units using full-listing or decomposition (Uygun & Gürel, 2016). The storage methods of morphological units has important implications for comparing the acquisition of morphology between first language (L1) and second language (L2) learners. Languages with rich morphologically based grammatical representations present numerous challenges for L2 learners, especially when the L1 and L2 are typologically distant. By evaluating current literature on child L1 Turkish learners and adult L2 Turkish learners, this article compared the observed similarities and differences between the two populations. The analysis sought to discuss the main differences in the acquisition of Turkish morphology between L1 speakers and L2 learners and answer if L1 and L2 learners' processing models are similar or different. It was hypothesized that L2 speakers will have delayed acquisition of non-productive, infrequent morphemes and experience slower acquisition based on L1-L2 typological distance and that child acquisition would support the decomposition model and adult L2 acquisition would follow the full-listing model. The analysis found that L1 and L2 morphological processes are more similar than originally hypothesized and that a mixed processing model is a more accurate representation for both. Furthermore, L2 acquisition is affected more by L1 influence than by the processing model. The implication of this analysis is that learners use the Dual Route Processing Model and, currently, the literature remains unclear about the language specific interactions in this model.

Keywords: acquisition, Turkish, L1 and L2 comparison, Dual Route Processing Model

Introduction

The study of the acquisition of morphology is particularly interesting in languages that mainly express grammatical properties morphologically, such as agglutinating languages. Turkish is a relatively organized and systematic agglutinating language with multiple areas of complexity for language learners to acquire. This paper compares first language (L1) and second language (L2) processes of acquisition in Turkish and assesses how L1 and L2 learners process and cognitively represent morphological units.

The paper is organized as follows. First, I discuss the literature on morphological acquisition. Second, I present the morphological features of Turkish. Third, I summarize the literature on child L1 and adult L2 Turkish learners. Fourth, I discuss the results, conclusions, and implications gleaned from the current analysis.

Acquisition of Morphology

Extensive studies on child morphology acquisition show that the speed and ease of acquisition is affected by frequency of forms[1], simplicity of meaning,[2] and typology (Clark, 2017). The same factors also influence L2 acquisition, but now the language being learned must compete with the existing L1, especially in adult learners. By measuring reaction time (RT), researchers found that L2 learners process words based on morphological complexity, frequency, and ease of recognition (Uygun & Gürel, 2016). Early research asserted that agglutinative languages must be processed via decomposition, breaking down a morphologically complex word and storing the smaller units, because, in an effort to make information storage more efficient, decomposition

[1] This is also referred to as regularized forms (Clark, 2017).

[2] A common example of semantically complex forms is compounds, especially those from which the meaning is not the sum of the parts.

seemed more probable than full-listing[3] (Uygun & Gürel, 2016). Through further assessment, researchers have revised their position to account for high frequency morphemes saying that morphemes with high frequency can be accessed by "direct route or parsing route" (Uygun & Gürel, 2016, p. 258). They posit that L2 learners will utilize a dual route model for word processing where regular and high frequency morphemes follow decomposition and irregular morphemes follow full-listing, but they assume that L2 learners will heavily depend on full-listing of forms in the mental lexicon (memorization) (Uygun & Gürel, 2016).

However, these assumptions do not account for the potential morphological and lexical similarities between an individual's L1 and L2. One potential positive effect on L2 acquisition is neighborhood density, which is an analogy for groups of similar words (e.g., bat, rat, cat, sat) that results in faster RTs when the neighborhood is dense (Costa et al., 2006). When an L2 is acquired, learners will figuratively combine similar neighborhoods; thus, these words from the L2 which fit into a denser neighborhood will most likely have a faster RT and better rate of acquisition (Costa et al., 2006). More good news for Turkish learners is that researchers claim that Turkish suffixes are more easily acquired because of the one-to-one relationship of form and meaning (Clark, 2017) and as learners become more proficient, they adapt how they process and access morphemes (Uygun & Gürel, 2016).

Turkish Morphology

Turkish is a morphologically rich agglutinating language with features such as case marking and vowel harmony. Turkish is a nominative-accusative language and has six cases: accusative, dative, locative, ablative, comitative/instrumental, and genitive (Göksel & Kerslake,

[3] Full-listing is where every possible word with affix combinations are stored individually. This term will be explained in more detail in section 3.2.

2011). An agglutinating language is where chunks of information, often packaged in affixes like prefixes or suffixes, are added on to a noun or verb to change the meaning, like in example (1).

(1)

a) ev	b) ev-im	c) ev-im-de
house	house-1SG.POSS	house-1SG.POSS-LOC[4]
'house'	'my house'	'to/at my house'

Like most languages with derivational and inflectional morphology, Turkish orders affixes so that derivational affixes are closer to the stem and inflectional affixes come after (see 2-3) (Yavuz & Balci, 2011).

(2) Öğrenci -ler -im okul -dan gel -iyor -lar
Student -PL -1SG.POSS school -ABL come -PRES.PROG -3PL.AGR[5]
'My students are coming from school.' [6]

(3) görev -len -dir -e -me -dik -ler -imiz -den -mi -siniz
sent -Vforming -CAUS -can -NEG -NOM -PL -1PL.POSS -from -Qmarker -2.PL
'Are you among those whom we were unable to assign a position to?' (Ekmekci, 1982, p. 1)

The order of inflectional and derivational morphemes is important as an unintended order could result in the utterance being ungrammatical or have a different meaning, but fortunately, these orderings are predictable in Turkish, hence bounding morphological uncertainty-based measures of what may consider lexical items as more complex than others (Yavuz & Balci, 2011).

In addition to the abundance of affixes in Turkish, these affixes abide by the phonological processes of vowel harmony and voicing assimilation. An example of vowel harmony is listed in (4) using the reported past marking (Yavuz & Balci, 2011, p. 70). An example of both processes can be found in (5) (Yavuz & Balci, 2011, p. 71).

[4] List of glossing abbreviations in order of appearance: 1- first person, SG- singular, POSS- possessive, LOC- locative, PL- plural, ABL- ablative, PROG- progressive, 3- third person, AGR- agreement, CAUS- causative, NEG- negation, NOM- nominative, 2- second person.

[5] See Yavuz & Balci (2011), chapter 5 for more on the various derivational and inflectional affixes in Turkish and how each affects the word form on which it is attached.

[6] Example created by author based on existing Turkish language knowledge from personal study.

(4)

-mış	al-mış	sız-mış
-miş	sil-miş	sez-miş
-muş	uyu-muş	soy-muş
-müş	gör-müş	gül-müş

(5)

-dı	kal-dı	kız-dı	-tı	sars-tı	kırıt-tı
-di	gel-di	giy-di	-ti	kes-ti	it-ti
-du	uyu-du	soy-du	-tu	tut-tu	kop-tu
-dü	öv-dü	yürü-dü	-tü	öt-tü	ürk-tü

On the surface, Turkish morphology may seem difficult, but the language follows patterns that can be learned beyond memorizing forms.

Child Turkish Learners

Researchers have closely examined the language processing of adults and children. Initially, they thought that children and adults both processed language incrementally for the purpose of predicting other items in the speech stream (Özge, 2016). Only within the last decade have researchers discovered that children and adults do not process language the same, but the foundational mechanisms for adult-like processing are present (Özge, 2016). Children are observed to depend on lexical items, ignore morphosyntax in favor of word order, and forego "reliable cues in favor of frequent ones" (Özge, 2016, p. 100). A child's preference for frequent cues is not surprising because predictability is often a frequency-weighted measure (Clark, 2017).

Through spontaneous child-speech study, utterances of children under 2-years-old tend to have multiple bare stem words in Turkish production rather than multimorphemic words (Batman-Ratyosyan, 2003). That does not mean that Turkish children do not use affixation before they are two. Ekmekci et al. (1982) observed that children begin using affixes as early as 1;3 (p. 9). They tend to begin with inflectional morphemes and test these out on single words and try different uses

of these affixes; gradually, they learn derivational affixes and negotiate where they go as well (Ekmekci et al., 1982).

An example of Turkish child language acquisition processes is the causative which has multiple forms, four affixes and a lexical item; it can also be doubly marked (Ger et al., 2022; Nakipoğlu et al., 2022). Because the causative has some variation in form yet is often regular and frequent in input, assessing child acquisition of this feature provides a glimpse of the general learning process. The researchers determined that although perception of the causative starts around 18-months-old and children begin using the causative more productively around 2-years-old, consistent comprehension and use of the causative emerges at approximately 5-years-old (Ger et al., 2022). Two of the causative's affixes are irregular and have shown to have a delayed acquisition effect (Nakipoğlu et al., 2022). Turkish learners as old at 10 still have difficulty perceiving and using the irregular causative forms (Nakipoğlu et al., 2022). Child productivity of the causative is a good indicator as to if the child is making syntactic or morphological overgeneralizations (Nakipoğlu et al., 2022). Furthermore, researchers found that even young heritage language learners' morphological processing is similar to L1 children; the most distinct difference between the two populations was reaction time (Jacob et al., 2019). To summarize, child language acquisition of Turkish researchers determined that mental processing and productivity of these markers are learned overtime. Some markers are easier to learn (e.g., inflectional) and some take longer than others (e.g., causatives).

Adult Turkish L2 Learners

Learning Turkish as a foreign language has become more popular since 1991 due to international education initiatives to provide study abroad opportunities with the emergence of the

"Great Student Project" (Eryiğit et al., 2021, p. 3). In the last decade, Türkiye has had an influx of Syrian Arabic speakers, thus increasing the demand for teaching Turkish as a foreign language (TTFL) and the creation of interesting online learning applications using improved pedagogical strategies (Eryiğit et al., 2021).

Second Language Acquisition research has consistently observed that adult language learners may have particular difficulty with morphology, especially case markers because of the syntactic and semantic dependencies on top of morphology's harder paraphrastic nature and use of distributional patterns (Babanoğlu & Ağçam, 2020). To examine the difficulty of learning L2 Turkish, Babanoğlu & Ağçam (2020) assessed Turkish language learners' (TLLs) abilities to make grammaticality judgements using a scrambled sentence task. They found that TLLs have some trouble "unscrambling sentences that require the use of multiple case markers" (Babanoğlu & Ağçam, 2020, p. 35). Similarly, a study of Greek TLLs analyzed learners' grammaticality judgements of case markings and word order, finding that TLLs' use of case morphology varies because of the L1 influence of case marking in Greek (Papadopoulou et al., 2011). Another study of Greek TLLs looked at the difficulties L2 Turkish learners face with tense, aspect, and modality (TAM) markers (Kaili et al., 2016). Without diving too deep into TAM theoretical frameworks, the researchers identified that acquisition for these types of markers tend to be more L1-influence specific (Kaili et al., 2016). Other studies have similarly demonstrated the cross-linguistic influence of a learner's L1 on their L2 processing and production (Wu & Juffs, 2022). As seen throughout acquisition literature, transfer effects often correlate to typological distance (Wu & Juffs, 2022).

Research Question and Rationale

This analysis seeks to answer the following questions: 1) What are the main differences in the acquisition of Turkish morphology between first language speakers and second language learners? 2) Are Turkish L1 and L2 learners' processing models similar or different? The rationale of this comparative analysis is that previous studies have looked at either L1 or L2 acquisition of Turkish morphology but have yet to look at the similarities and differences in morphological processing of both L1 and L2 Turkish learners. This article aims to bridge this gap in the literature through a comparative analysis of previous literature.

My hypothesis is that second language learners will have delayed acquisition of non-productive and infrequent morphemes and that there will be evidence of slower acquisition of Turkish morphology for learners whose first language is less morphologically rich than the morphological processes of Turkish, supporting cross-linguistic influence. Regarding the second research question, based on the previous literature, I anticipate that child acquisition will more readily support the Decompositional Processing Theory (DPT) and adult L2 acquisition will align with the Lexical Representation Models.

Analysis

Decompositional Processing Theory

The Decompositional Processing Theory originates from the decompositional processing model which "assumes that a multimorphemic word is obligatorily parsed into constituent morphemes" (Uygun & Gürel, 2016, p. 254). Previous studies reported that English L1 speakers use decomposition for inflected forms (Feldman et al., 2010 in Uygun & Gürel, 2016). A study on Russian L1 processing data consistently supports decompositional processing (Gor & Jackson,

2013 in Uygun & Gürel, 2016). In Gor & Jackson's (2013) study, they found that Russian (fusional typology) TLLs exhibited decompositional processing but English (isolating typology) TLLs did not (in Uygun & Gürel, 2016). These conclusions reinforce the role of the L1's cross-linguistic influence in language processing but posit some inconsistencies between previous claims about L1 English speakers' and TLLs' inability to unscramble morphologically complex units, especially Case and TAM markers (Babanoğlu & Ağçam, 2020; Kaili et al., 2016).

Lexical Representation Models

Unlike the DPT, Lexical Representation Models generally assume that morphological units are processed and stored as a lexical unit where "the recognition of multimorphemic forms is based on whole-word activation," known as full-listing (Uygun & Gürel, 2016, p. 254). Research in the 1990s found that in English, regular inflected forms with higher frequency are stored in full-list fashion for efficient accessibility (e.g., Alegre & Gordon, 1999; Sereno & Jongman, 1997 in Uygun & Gürel, 2016).

Another model is the Feature Reassembly Hypothesis (FRH) stating that learners process the input by reassembling and packaging it with L1 information and then storing it as a lexical unit (Montrul, 2016). Analyzing causative and inchoative distinctions, Montrul (2016) observed that L2 learners' responses and grammaticality judgements varied based on L1 influence and the learner's ability or difficulty storing morphological features in lexical representations.

Dual Route Processing Model

As is often a reality of linguistic research, sometimes one analysis is insufficient to account for all the variables of language use and acquisition. As discussed previously in section 1.3, child L1 Turkish learners gradually develop their processing effectiveness and efficiency as they become more proficient in the language. Unfortunately, there is limited research on L1 Turkish

processing, but based on generalizations of other morphologically rich, agglutinating languages, we can posit the following processing possibilities for Turkish L1 acquisition (Uygun & Gürel, 2016). Children often start with full-listing, then decomposition, and then a mixed model where regular and highly frequent items are fully-listed and others are decomposed (Uygun & Gürel, 2016). Similarly, L2 processing is not as simple as decomposition or full-listing; rather, L1-typological influences will affect how some of each model is used for processing and storing linguistic information (Uygun & Gürel, 2016).

Conclusion and Implications

This analysis sought to expound on the main differences in the L1 and L2 acquisition of Turkish morphology and compare L1 and L2 processing models. The established literature asserts that cross-linguistically, morphology is difficult to acquire, whether it is one's L1 or L2. Some studies have presented processing models and hypotheses for how morphology is stored in child and adult learners. Contrary to the aforementioned hypothesis, child and adult morphological processes are not too different. The DPT and Lexical Representation Models, such as full-listing and the FRH, attempt to account for morphological processing; however, more recent researchers express that a mixed processing model is more accurate because studies demonstrated that learners create faster parsing routes to items that are regular and highly frequent in their input and utilize decomposition for other morphological items. Furthermore, another factor to consider in morphological processing of L2 learners is cross-linguistic, L1 influence. The implications of this analysis are that morphological processing is a gradual progression for L1 and L2 speakers of a language. One overarching generalization is that language learners' processing and storage follow a Dual Route Processing Model and the shared responsibility between the two models varies from

language to language. Moving forward, the literature in the area of comparing L1 and L2 acquisition within languages has much more to discover. As mentioned by some of the authors, more research is needed regarding the extent of L1 effects on L2 processing to gain a clearer picture of the Dual Route Processing Model to compare L1 and L2 acquisition of morphology in various language environments and typologically different languages.

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