# Exploring fine restrictions in the derivation of deverbal adjectives in Greek

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*Περίληψη*

*Η παρούσα έρευνα εστιάζει στα ρηματικά επίθετα τα οποία σχηματίζονται με τα επιθήματα -σίμος, -μένος και -τος. Προηγούμενες μελέτες έχουν δείξει ότι κάθε επίθημα φέρει ξεχωριστούς περιορισμούς όσον αφορά τον συνδυασμό του με ρηματικές ρίζες. Στην παρούσα έρευνα εξετάστηκε το σθένος αυτών των περιορισμών διερευνώντας την αποδεκτότητα σχηματισμών που τους παραβιάζουν. Για το σκοπό αυτό κατασκευάστηκε ένας μεγάλος αριθμός ψευδολέξεων που παραβίαζαν τους περιορισμούς της γραμματικής κατηγορίας και των θεματικών χαρακτηριστικών των επιθημάτων. Παράλληλα, κατασκευάστηκαν νεολογισμοί που δεν υπόκειντο σε καμία παραβίαση. Τα αποτελέσματα έδειξαν μια διαβάθμιση σχετικά με την αποδεκτότητα φέρνοντας στην επιφάνεια λεπτές διαφορές μεταξύ των ρηματικών κατηγοριών.*

*Λέξεις-κλειδιά: ρηματικά επίθετα, ελληνικά, θεματικά χαρακτηριστικά, περιορισμοί, αποδεκτότητα*

## 1  Introduction

Deverbal adjectives in Greek are formed by adding adjectival suffixes to verbal stems (e.g. *anigo* 'to open' + *-tos* = aniktos 'open') and according to lexicalist theories of morphology, as the one proposed by Ralli (2005), they are considered to inherit the thematic features of the verbal stem and the suffix. *Thematic features* determine the number and the quality of thematic roles involved in the activity described by the verb, as well as the way these thematic roles form grammatical relations. Thematic features differ among individual verb types, given that each verb type carries its own. For instance, the verb *trexo* 'to run', which is unergative and takes no complement, has an argument structure of the type described in (1).

(1) *O Jannis trexi* 'John runs' <Agent>

Similarly, examples 2 and 3 illustrate what thematic roles are associated with the verb *anigo* 'to open' and how they are realized in sentential context.

(2) *O Jannis anikse tin porta* 'Jonh opened the door' <Agent<Theme>>

(3) *I porta anikse* 'The door opened' <Theme>

The same holds also for individual suffixes. Each suffix carries its own thematic features, which in turn create constraints allowing or disallowing the attachment to certain types of verbal stems (i.e. *thematic constraint*). For example, the suffix –*simos*, according to Manouilidou (2007), has an argument structure of the type <Theme <Event>> and therefore gets attached to transitive verbal stems having an argument structure of the type: <Agent<Theme>>, as described in (4).

(4) *ekpedevo* 'to train' < *ekpedef-simos* 'train-able'.

Hence, when the suffix gets attached to verbal stems of a different argument structure of what they are typically attached to, the result is a pseudoword with *thematic violation* (ThemViol), as in example 5.

(5) *treksimos.

The other kind of constraint concerning deverbal word formation is that of the grammatical category of the root (i.e. *categorial constraint*), which has to be verbal. The violation of this constraint results in word formations which constitute *categorial violations* (CatViol), as in example 6.

(6) trapezi 'table' < *trapezimos 'table-able'

The paradigm of violations is a common method used in psycholinguistic studies, in order to investigate the morphological processing of complex lexical items. The present study focuses exclusively on *deverbal adjectives* and explores how distinct types of verbal and non-verbal stems interact with the suffixes under investigation. Specifically, the focus of interest in the present study is whether the parser is indeed sensitive to finer grained thematic information and if this is reflected in pseudoword rates of acceptance.


*1.1 Theoretical Background*

Deverbal adjectives in Greek are formed with the suffixes *-simos,* and *-tos*, which are equivalent to the English 'able'; the suffix *–menos*, is used to form adjectival participles. All these suffixes require verbal stems and more specifically each of them follows specific constraints concerning the type of verbal stems it can be attached to.

The specific suffixes have been the topic of earlier investigations, such as that of Anastasiadis-Symeonidis (1995). The present study is based on new theoretical advancements by Alexiadou (2018), Anagnostopoulou and Samioti (2013) and Anagnostopoulou (2003), which brought into light subtle differences among them. For instance, the suffix *-simos* cannot be combined with unergative verbs (e.g. *trexo* 'to run'), causatives (e.g. *spao* 'to break'), psychological verbs (e.g. *agapo* 'to love'), and verbs of alternating situation, namely inchoatives, (e.g. *zesteno* 'to warm').

On the other hand, the suffix *-tos* is attached directly only to roots expressing events (e.g. *ftiaxno* 'to make'). Particularly, *–tos* gets attached to eventive roots, such as those postulated by Anagnostopoulou and Samioti (2013; 2014): $Root_{undefined}$ + verbalizer, (e.g. *kt-* 'undefined meaning' < *kt-iz-o* 'to build' < *kt-is-tos* 'built') and $Root_{event}$, (e.g. *ftiaxno* 'to make' < *ftiax-tos* 'make-able').

Finally, *–menos* cannot be attached to verbal roots denoting a standard situation (e.g. *ksero* 'to know') or not licensing agentive prepositional phrases, such as psych verbs, (e.g. *diaskedazo* 'to have fun'). In addition, Anagnostopoulou (2003) studying the syntactic properties of *–menos* revealed a dual attachment, that is *-menos* can either be attached to vP (verbalPhrase), not licensing an agentive by-phrase, e.g. *vraz-menos* 'boiled', or VP (VoicePhrase), licensing an agentive by-phrase, e.g. *kri-menos* 'hidden'. This difference is illustrated in (7) and (8).

(7) *Ta makaronia ine vrazmena (*apo to Jianni)* 'Spaghetti is boiled (*by John)',

(8) *O thisavros ine krimenos apo tus pirates* 'The treasure is hidden by the pirates'.

Thus, taking the above in mind, we conclude that although the derivational process is similar for all suffixes, each of them have its own specific restrictions regarding the roots it gets attached to.


*1.2 Psycholinguistic Background*

A significant number of studies carried out by Manouilidou (2006; 2007), Manouilidou and Stockall (2014), and Neophytou et. al. (2018) has used the paradigm of violations in order to investigate the processing of deverbal nouns and adjectives. These studies provided evidence for the role of grammatical category and thematic features in processing deverbal word formations.

Specifically, Manouilidou (2006) and Manouilidou et al. (2007) examined the role of thematic features in the processing of existing adjectives formed with the suffixes *–simos*, *menos*, *-tos* and *-tikos*. The results of their on-line lexical decision task indicated that the thematic features of the verb's stem influence the processing of deverbal word formations, yielding longer reaction times, only for those adjectives with high eventive properties (e.g. *katedafi-simos* 'demolishable', *kali-menos* 'covered'), compared to words with less verb-like features (e.g. *skalis-tos* 'engraved') and to denominal (e.g. *mallinos* 'wollen').

In a separate study, Manouilidou (2007) examined whether thematic features have a distinct function in building deverbal word formations. For this purpose, a corpus of pseudowords violating the thematic features of their constituents, the verbal stem and the suffix, was created. *Thematic violations* (e.g. *\*trek-simos > trexo* 'to run') were put under comparison together with other types of stimuli, such as *categorial violations* (e.g. *\*kutal-imos > kutali* 'spoon'), *novel words* (e.g. *\*skupis-tos > skupizo* 'to wipe') and *non-words* (e.g. *katakti-tís > \*kapakti-tís* 'conqueror' > * 'conperor') in an on-line lexical decision task.

Results revealed that between the two kinds of constraints the categorial ones were found to be stronger in relation to the thematic ones, which in turn seem to be more sensitive in terms of violability. This fact is reinforced by the finding that thematic violations were judged more often as grammatical in relation to categorial violations, whereas novel words demonstrated the highest acceptance rates of both violation types. Based on these findings, the authors postulated that the processing of thematic features takes place at a different, later stage of processing. Finally, the study concludes that the processing of thematic information appears to be obligatory, independently of the specific suffixes.

Manouilidou and Stockall (2014) further investigated the effect of thematic and categorial constraints in processing deverbal pseudowords, in two morphologically distinct languages, Greek and English. The results were similar for both languages with CatViol yielding greater acceptance rates and faster reactions times compared to ThemViol indicating a common cross-linguistic way of processing complex deverbal pseudowords.

Finally, Neophytou et. al. (2018), in an attempt to investigate the neurobiological profile of complex morphological processing, investigated the processing of pseudowords which violated the selectional constraints of suffixes either in terms of grammatical category or argument structure of the verbal stem. The experimental stimuli were drawn from Manouilidou and Stockall (2014) and were presented in an on-line visual lexical decision task combined with a simultaneous Magnetoengephalography data recording.

Categorial features were found to be processed in different brain areas and at an earlier time window compared to thematic features, suggesting that they are associated with distinct spatio-temporal profiles. Specifically, categorial information is processed at left temporal lobe, where syntactic licensing takes place, whereas thematic information is processed at left orbitofrontal cortex, a brain area connected to semantic interpretation. Concerning the acceptability, ThemViol were found to yield higher acceptance rates than CatViol. Nonetheless, despite the fact the three

suffixes (-*simos, -menos, -tos*) evoked a consistent pattern of processing, there were also detected differences among them, which were interpreted as results of the suffixes' properties. Concerning the suffix –*simos*, its strict high attachment stated by Alexiadou (2018), was suggested to make thematic violations easy to detect. On the other hand, -*menos* dual attachment, which can either be vP or VP, as it was suggested by Anagnostopoulou (2003), made the suffix ambiguous between the two meanings (i.e. result and target) and consequently caused a delay in detection of violations.

## 1.3 Aim

The aim of the current study is to test whether native speakers of Modern Greek are able to distinguish between different types of derivational violations (i.e. ThemViol - CatViol) and different types of stems used for the construction of deverbal adjectives. The former studies of Manouilidou (2007), Manouilidou and Stockall (2014) and Neophytou, et. al. (2018) contained only one-type violations (e.g. categorial violations derived from a nominal stem or thematic violations derived only from unergative stems), whereas the present research investigates the whole spectrum of possible unattested combinations. Moreover, with the insertion of novel words, which do not violate any constraint, in the experimental stimuli we intend to measure the acceptability differences between possible/grammatical and theoretically impossible/ungrammatical lexical items. The formulations derived are *thematic violations* and *novel words* (NovW) with multiple verb types, while *categorial violations* derived from both nouns and adjectives. This variety of combinations will point out fine distinctions among verb types and at the same time it will highlight the distinct interactions each suffix has with each type of verbal stem.

## 2    Method

### 2.1 Material

A large amount of pseudowords, all of them deverbal adjectives (n=501), was constructed. The ILSP PsychoLinguistic Resource was used to collect information about psycholinguistic factors, such as: stem frequency, number of letters, number of phonemes, number of syllables, number of orthographic neighbours, number of phonological neighbours, orthographic cohort and phonological cohort. Although attempts were made to match our stimuli with respect to these variables, there were slight differences. For instance, the mean stem frequency for CatViol differed from the one for ThemViol and NovW as illustrated in Table 1.

| Condition | Mean Stem Frequency |
|-----------|---------------------|
| ThemViol | 10.610,5 |
| CatViol | 25.679 |
| NovW | 12.697 |

**Table 1 | Mean Stem Frequency per Condition**

### 2.1.1. Thematic Violations

The suffixes –*simos, -tos, -menos*, were combined with roots of verbs that are not compatible according to their separate restrictions of attachment, and therefore they formulated thematic violations.
e.g. ksekino 'begin' [causative] > *ksekinisimos*
    perpato 'walk' [unergative] > *perpatitos*
    thavmazo 'admire' [psychological verb] > *thavmasmenos*


### 2.1.2. Categorial Violations

Categorial violations were created by adding the suffixes to either nominal or adjectival roots instead of verbal.
e.g. kefali (noun) 'head' > *kefalisimos*
    aspros (adjective) 'white' > *asprotos*
    pseftikos (adjective) 'fake' > *pseftikomenos*


### 2.1.3. Novel words

Novel words were constructed by combining the suffixes with verbal roots that do not violate any constraint according to theoretical descriptions.
e.g. sinanto 'meet' > *sinantisimos*
    charizo 'donate' > *charistos*
    akuo 'hear' > *akusmenos*


### 2.2 Participants

Seventy-two (72) native speakers of Modern Greek participated in the experiment. All of them were healthy adults at the age between 20-60 years old.


### 2.3 Procedure

An on-line grammaticality judgment task was conducted and it was presented to the participants through the GORILLA program which was used as the online platform of the experiment.  Participants were asked to evaluate these randomly presented words and decide whether they are possible in Greek or not. Before the appearance of each word a fixation [+] was shown at the center of the screen for a few seconds, in order to attract the attention of the participant, while under the word there were two options: YES or NO.


## 3    Results

The average acceptance rate across the different suffixes was 37% for Novel words, 28% for thematic violations and 9% for categorial violations. The findings are summarized at Table 2. Pairwise comparisons showed statistically significant differences between the three conditions (p. < 0001).

| Condition | Mean | Standard Deviation |
|---|---|---|
| Thematic Violations | 0.284 | 0.005 |
| Categorial Violations | 0.091 | 0.006 |
| Novel words | 0.371 | 0.005 |

**Table 2 | Mean Acceptance rate per Condition**

An one-way ANOVA taking into account suffix and condition as independent variables and the response type (YES/NO) as the dependent variable revealed a main effect of condition [$F_{(11,566)}= 638.071$, p. $< .0001$] and a main effect of suffix [$F_{(1,078)}= 108.631$, p. $< .0001$]. In addition, an interaction [$F_{(3,477)}= 19.366$, p. $< .0001$] between the two was also revealed. Results are illustrated in Figure 1.
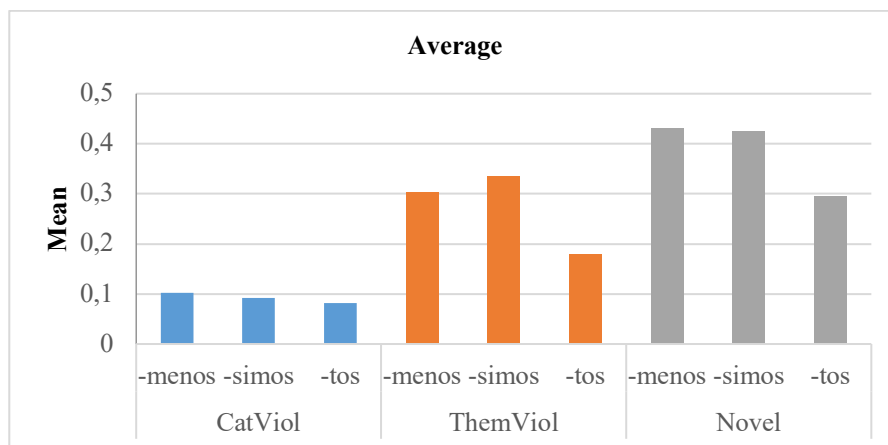


**Figure 1 | Mean Acceptance Rate per Condition and Suffix**

In addition, pair-wise comparisons between each condition with respect to the suffix resulted to statistically significant differences, presented in Table 4.

| Suffix | Minimal pairs | p value |
|---|---|---|
| -menos | ThemViol – CatViol | 0.000 |
| -menos | ThemViol – NovW | 0.000 |
| -menos | CatViol – NovW | 0.000 |
| -simos | ThemViol – CatViol | 0.004 |
| -simos | ThemViol – NovW | 0.000 |
| -simos | CatViol – NovW | 0.000 |
| -tos | ThemViol – CatViol | 0.000 |
| -tos | ThemViol – NovW | 0.000 |
| -tos | CatViol – NovW | 0.000 |

**Table 4 | Minimal pairs of conditions per suffix and their p values**

For *categorial violations*, the mean acceptance rate was 9% and formations with the suffix *–menos* noted the highest acceptance rates (Mean: 10%, SD: 0.011), while formations with *–simos* (Mean: 9%, SD: 0.011) and *–tos* (Mean: 8%, SD: 0.009) were following. An one-way ANOVA showed that the difference among the three kinds of categorial violations was not significant (p. $> .005$).

Furthermore, categorial violations derived from a nominal stem presented higher acceptance rates (Mean: 11%, SD: 0.008) than those derived from an adjectival stem (Mean: 7%, SD: 0.010). A pairwise comparison revealed that the difference between the two was significant (p. $< .0001$).

Concerning *thematic violations* and *novel words* an one-way ANOVA revealed a main effect of verb type [$F_{(12,540)}= 127.366$, p. $< .0001$] and a main effect of suffix [$F_{(1,078)}= 17.724$, p. $< .0001$], whereas the interaction revealed between each verb type and each suffix was also significant [$F_{(2,789)}= 11.310$, p. $< .0001$].

Interesting findings emerge, when we look at each suffix separately. In Table 5 the mean acceptance rates of thematic violations and novel words created with the suffix *–menos* are presented. For this suffix the verb type with the highest acceptance rates proved to be this of the PsychSubExp verbs (Mean: 47.4, SD: 0.028), which forms thematic violations, and whose difference from the rest of verb types was statistically significant (p. $= .000$), with the exception of the transitive and the perception verbs (p. $= 1.000$), which both form novel words.

| Condition | Verb type | Mean | Standard Deviation |
|-----------|-----------|------|--------------------|
| ThemViol | Causative/inchoative | 0,239 | 0,039 |
| ThemViol | Unergative | 0,278 | 0,016 |
| ThemViol | Inchoative | 0,246 | 0,031 |
| ThemViol | Psych ObjExp | 0,275 | 0,033 |
| ThemViol | Psych SubExp | 0,474 | 0,028 |
| ThemViol | State | 0,284 | 0,017 |
| Novel | Perception | 0,436 | 0,030 |
| Novel | Transitive | 0,473 | 0,014 |
| Novel | Ditransitive | 0,193 | 0,040 |

**Table 5 | Suffix –menos per verb type**

Concerning the rest of verb types combined with *-menos*, pairwise comparisons between all verb types demonstrated statistically significant differences for specific pairs of verb types. The results are illustrated in Table 6.

| Minimal pairs | Conditions | p value |
|---------------|------------|---------|
| Causative/inchoative – perception | ThemViol – NovW | 0.004 |
| Causative/inchoative – transitive | ThemViol – NovW | 0.000 |
| State – perception | ThemViol – NovW | 0.001 |
| State – transitive | ThemViol – NovW | 0.000 |
| Inchoative – perception | ThemViol – NovW | 0.000 |
| Inchoative – transitive | ThemViol – NovW | 0.000 |
| Unergative – perception | ThemViol – NovW | 0.000 |
| Unergative – transitive | ThemViol – NovW | 0.000 |
| PsychObjExp – transitive | ThemViol – NovW | 0.000 |
| Ditransitive – perception | NovW – NovW | 0.000 |
| Ditransitive – transitive | NovW – NovW | 0.000 |

**Table 6 | Suffix -menos minimal pairs of verb types with statistically significant differences**

In Table 7 the mean acceptance rates of thematic violations and novel words created with the suffix *–simos* are presented. For this suffix the verb type with the highest acceptance rates was found to be this of the causative verbs (Mean: 53.8, SD: 0.020), which forms a thematic violation and whose difference from the rest of verb types was proved to be statistically significant (p. $< .005$), with the exception of the ditransitive and the PsychObjExp verbs (p. $= 1.000$).

| Condition | Verb type | Mean | Standard Deviation |
|---|---|---|---|
| ThemViol | Causative/inchoative | 0,237 | 0,015 |
| ThemViol | Causative | 0,538 | 0,020 |
| ThemViol | Unergative | 0,356 | 0,016 |
| ThemViol | Inchoative | 0,189 | 0,027 |
| ThemViol | Psych ObjExp | 0,432 | 0,020 |
| ThemViol | Psych SubExp | 0,276 | 0,020 |
| ThemViol | State | 0,175 | 0,070 |
| Novel | Perception | 0,287 | 0,035 |
| Novel | Transitive | 0,409 | 0,011 |
| Novel | Ditransitive | 0,490 | 0,015 |

**Table 7 | Suffix –simos per verb type**

Concerning the rest of verb types combined with -*simos*, pairwise comparisons between all verb types demonstrated statistically significant differences for specific pairs of verb types. The results are illustrated in Table 8.

| Minimal pairs | Conditions | p value |
|---|---|---|
| Causative/inchoative – ditransitive | ThemViol – NovW | 0.000 |
| Causative/ inchoative – transitive | ThemViol – NovW | 0.000 |
| Causative/ inchoative – PsychObjExp | ThemViol - ThemViol | 0.000 |
| Causative/ inchoative – unergative | ThemViol - ThemViol | 0.000 |
| Inchoative – ditransitive | ThemViol – NovW | 0.000 |
| Inchoative – PsychObjExp | ThemViol - ThemViol | 0.000 |
| Inchoative – unergative | ThemViol - ThemViol | 0.000 |
| PsychSubExp – PsychObjExp | ThemViol - ThemViol | 0.000 |
| PsychSubExp – ditransitive | ThemViol – NovW | 0.000 |
| PsychSubExp – transitive | ThemViol – NovW | 0.000 |
| State - ditransitive | ThemViol – NovW | 0.001 |
| Unergative – causative | ThemViol - ThemViol | 0.000 |
| Unergative – ditransitive | ThemViol – NovW | 0.000 |
| Ditransitive – transitive | NovW – NovW | 0.001 |

**Table 8 | Suffix -simos minimal pairs of verb types with statistically significant differences**

Results for the suffix –*tos* are presented in Table 9. The verb type that with the highest acceptance rates was that of ditransitive verbs (Mean: 34.8, SD: 0.025), whose difference is statistically significant only from the PsychObjExp and the inchoative verbs ($p > .005$). In the thematic violations of the suffix –*tos*, the verb type of the unergatives has proven to score the highest acceptance rates (Mean: 23.9, SD: 0.013) noting a statistically significant difference from the inchoatives and the transitives ($p = .000$).

| Condition | Verb type | Mean | Standard Deviation |
|---|---|---|---|
| ThemViol | Causative/inchoative | 0,169 | 0,019 |
| ThemViol | Unergative | 0,239 | 0,013 |
| ThemViol | Inchoative | 0,085 | 0,020 |
| ThemViol | Psych ObjExp | 0,162 | 0,018 |
| ThemViol | Psych SubExp | 0,195 | 0,023 |
| ThemViol | State | 0,300 | 0,061 |
| Novel | Perception | 0,266 | 0,031 |
| Novel | Transitive | 0,323 | 0,009 |
| Novel | Ditransitive | 0,348 | 0,025 |

**Table 9 | Suffix –tos per verb type**

Concerning the rest of verb types combined with *-tos*, pairwise comparisons between all the verb types demonstrated statistically significant differences for specific pairs of verb types. The results are illustrated in Table 10.

| Minimal pairs | Conditions | p value |
|---|---|---|
| Causative/inchoative – ditransitive | ThemViol – NovW | 0.000 |
| Causative/inchoative – transitive | ThemViol – NovW | 0.000 |
| Inchoative – ditransitive | ThemViol – NovW | 0.000 |
| Inchoative – PsychSubExp | ThemViol – ThemViol | 0.000 |
| Inchoative – perception | ThemViol – NovW | 0.000 |
| Inchoative – transitive | ThemViol – NovW | 0.000 |
| PsychObjExp – transitive | ThemViol – NovW | 0.000 |
| Perception – ditransitive | NovW – NovW | 0.000 |
| Perception – ditransitive | NovW – NovW | 0.000 |

**Table 10 | Suffix -tos minimal pairs of verb types with statistically significant differences**

The above findings will be discussed in the section below.


## 4    Discussion

The primary goal of the current study was to investigate whether native speakers are able to distinguish among distinct types of violations and distinct types of stems used for the construction of deverbal adjectives in Greek created with *–tos, -menos, -simos*. Thus, we examined to what extent lexical items that violate the attachment restrictions of the above suffixes are accepted with regard to the thematic features and the grammatical category of the base. This interaction was examined with respect to the acceptability of all possible formations, including lexical items following the grammatical rules (NovW), as well as different kinds of violations being subject to constraints, thematic (ThemViol) or categorial (CatViol). To address this issue an on-line grammatical judgment task was carried out.

The behavioral results of the grammatical judgment task confirmed previous findings of psycholinguistic and neuroimaging studies of Manouilidou (2007), Manouilidou and Stockall (2014) and Neophytou et. al (2018). Thematic violations, such as *ksekinitos* 'begin-able', were accepted more often as grammatical than categorial violations, such as *kareklatos* 'chair-able', whereas novel words, like *charistos* 'give-able', were found to yield greater acceptance rates than both kinds of violations. This fact also corroborates the finding of Manouilidou (2007) and Manouilidou and Stockall (2014) that categorial constraints hold a more prominent role in processing of deverbal adjectives. Furthermore, an interaction between suffix and condition was revealed. This fact indicates that the thematic features of each suffix defined the acceptance rates of the three conditions (ThemViol, CatViol, NovW).

Nonetheless, the insertion of a variety of verb types in the experimental material revealed subtle differences among them. Firstly, the observed interaction between the verb type and the suffix implies that the differences among suffixes were determined by the verb type of the stem. Studies on the syntactic compatibility of the adjectival suffixes have proposed combinatory restrictions concerning each suffix.

Alexiadou (2018) stated that "*verbs that can be attached to a non-active morphology but they cannot receive a passive interpretation, as they are not compatible with agentive by-phrases, e.g. skotono 'kill'* " are not compatible with the suffix *–simos*. In the current data, however, words containing thematic violations

constructed by causative verbs and the suffix –*simos* (e.g. *\*skotosimos* 'kill-able') had the highest acceptance rate (54%), comparing to the rest of formations, including also lexical items of the other two suffixes (-*menos*, -*tos*). This finding implies that their incompatibility with agentive by-phrases perhaps does not play such an influential role in their productivity, since their passive morphology itself allows them to be attached to the suffix –*simos*. This fact is interesting on its own, since lexical items being subject to constraints were judged as more grammatical than those that were considered to follow the suffixes' restrictions of attachment.

As it was stated in Neophytou et al. (2018), the dual capability of the suffix –*menos* with respect to its attachment, which can either be vP or VP, causes a delay in processing, since the suffix is ambiguous between the two possible attachments. This dual attachment of -*menos* causes in our case a distinct preference between the two subtypes: PsychSubExp and PsychObjExp, as the former presented higher acceptance rates in relation to the latter with their difference to be statistically significant. Assuming that PsychSubExp verbs have a vP attachment, therefore they cannot license an agentive by-phrase, (e.g. *\*charika apo kapjon*) in contrast to PsychObjExp verbs which bear an object and subsequently can license an agentive by-phrase, (e.g. *o daskalos ekplisete apo tus mathites tu*). Thus, we could argue that the vP attachment is the syntactic property that makes the PsychSubExp subtype more acceptable than the PsychObjExp subtype in ThemViol of -*menos*.

Nonetheless, this was not the case for the suffix –*tos,* which presented systematically the lowest acceptance rates in relation to the other two suffixes. This finding may be attributed to the fact that the suffix, according to Manouilidou et. al. (2007), does not inherit the thematic features of the verbal stem to the fullest. Therefore, it is not affected by them in the way the other two suffixes (-*menos*, -*simos*) are, while its adjectival properties remain intact.

Summarizing the main findings, native speakers distinguish not only between different types of violations (CatViol - ThemViol) but also between distinct verb types, and therefore between the distinct thematic features they carry. Each argument structure combined separately with the three suffixes (-*simos*, -*menos*, -*tos*) (resulting to a unique type of pseudowords) had a different impact on the acceptance of the derived pseudowords. Therefore, within the same experimental conditions (i.e. ThemViol and NovW) were found differences based on the type of the verbal stem. The fact that combinations, such as *causatives + -simos* and *PsychSubExp + -menos*, were considered as violations did not influence the participants' judgment, since they judged them as more grammatical than those considered to follow the suffixes' restrictions (i.e. novel words). Thus, these findings contradict existing theories concerning the attachment restrictions of the suffixes –*menos* and -*simos*.


## 5    Conclusion

The above findings highlight the contribution of thematic features in derivation of deverbal adjectives. In sum, the present study provides evidence about the acceptability patterns of the deverbal adjectives in Modern Greek using the suffixes –*simos*. –*menos, -tos*. The individual combinations of each verb type with each suffix led to distinct results with respect to acceptability. Thus, the suffixes' attachment restrictions (which arise from the suffixes' thematic features) interact differentially with the verbs' thematic features in every combination. Therefore, a gradation

concerning the acceptability among verb types was revealed with some combinations, even within the same condition, being evaluated as more grammatical than others.

Based on the empirical evidence of the present research, we have been able to redefine issues of deverbal word formation and suffix compatibility by revealing which linguistic properties act more effectively in deverbal word formation. However, future research is required using a variety of methodologies in order to draw conclusions about the nature of morphological processing of such complex derived lexical items, and understand the underlying reasons that contributed to these results.

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