“COMPREHENSION OF DEVERBAL ADJECTIVES IN GREEK: EVIDENCE FROM HEALTHY AND BRAIN-DAMAGED POPULATIONS”

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Abstract in English

The present study explores subtle restrictions in the derivation of Greek deverbal adjectives formed with the suffixes –simos, -menos and –tos. Even though they are similar in meaning, previous research (Alexiadou, 2018; Anagnostopoulou, 2003; Anagnostopoulou, & Samioti, 2013) has shown that each of them cannot combine with certain verb categories. Specifically, the suffix –simos is not compatible with causative, inchoative, causative/inchoative, psych and unergative verbs, the suffix –menos with state, inchoative and unergative verbs, and the suffix –tos with inchoative, unergative and psych verbs having the experiencer as subject. Thus, formations such as treksimos, tregmenos, trextos are not acceptable in Greek (all formed on the basis of unergative trexo “run”). By using a large number of pseudowords containing thematic violations, created by the combination of these suffixes with verbs that are not normally combined with (e.g. ksekino ‘begin’ [causative/inchoative] < ksekinisimos, ksekinimenos, ksekinitos) and categorical violations, created by the combination of these suffixes with nominal instead of verbal roots (e.g. limni ‘lake’ [no verb] < limnisisimos, limnimenos, limnitos), as well as novel words (e.g. diigoume ‘narrate’ [transitive] < digisisimos, digimenos, digitos), previous psycholinguistic research has shown that processing of thematic violations (gelasimos ‘laugh-able’) occurs at distinct timeframe (Manouilidou, 2007) and at distinct brain locations (Neophytou et al, 2018) than that of categorical violations (varelimos ‘barrel-able’). However, their thematic violations were strictly based on unergative verbs and their categorial violations were based on nouns.

The current research seeks to further investigate acceptability patterns of thematic and categorical violations using verb roots of various categories (causative, inchoative, causative/inchoative, subject and object experiencer verbs, state, unergative, transitive, ditransitive, perception verbs, ditransitive), in order to bring into light subtle differences in their derivation. An on-line acceptability task was conducted. 76 native speakers of Greek including 4 patients with logopenic Progressive Aphasia (lv-PPA) were asked to decide whether these words are real in Greek. A total of 501 words divided in two lists was used. The stimuli were consisted of three categories: thematic violations (191 items), categorical violations (131 items) and novel words (179 items). Results showed that the novel words were more acceptable (acceptance rate: 37%), followed by words with thematic violations (acceptance rate: 28%), and by categorical violations (acceptance rate: 9%), confirming previous psycholinguistic results. Interestingly, individual differences among suffixes emerged: for instance, when it comes to thematic violations, for the suffix –simos the most acceptable verb category is causative verbs (acceptance rate: 0.54%), (e.g.: skotono ‘kill’ < skotosimos), for –menos the most acceptable verb category is that of subject experience psych verbs (acceptance rate: 0.47%), (e.g.: anisicho ‘worry’ < anisichimenos), and for –tos the most acceptable verb category is unergative verbs (acceptance rate: 24%) (e.g.: perpato ‘walk’ < perpatitos). When it comes to novel words, the most acceptable combinations were with ditransitive verbs for both -simos (acceptance rate: 49%) and –tos (acceptance rate: 35%), (e.g.: eksigo ‘explain’ < eksigisisimos, eksigitos), whereas for –menos the most acceptable category was with transitive verbs (acceptance rate: 47%), (e.g.: diigoume ‘narrate’ < digimenos). Concerning the lv-PPA patients, they accepted the conditions in a sequence similar to the healthy population (NovW > ThemViol > CatViol). The only difference was that the acceptance rates were higher for all of combinations. This fact probably occurs, due to their difficulty processing morphological information. Results
indicate that there is a range in the acceptability of both thematic violations and novel words depending on the base verb. This finding informs the current literature by showing that acceptability rates depend on specific verb categories. Moreover, results indicate that what was classified as violations, based on theoretical grounds, was occasionally more acceptable than novel formations. This will be discussed in light of current theories suggesting that verbs at the spectrum of change of state, such as causatives, cannot be combined with –simos (Alexiadou, 2018), and state verbs, like subject experiencer psychological verbs cannot be combined with –menos (Anagnostopoulou, 2003).
Abstract in Greek

Η παρούσα εργασία διερευνά λεπτούς περιορισμούς στην παραγωγή των ελληνικών ρηματικών επιθέτων, τα οποία σχηματίζονται με τα επιθήµατα –σιµος, –µένος και –τος. Μολονότι είναι παρόμοια στη σηµασία, προηγούµενες έρευνες (Alexiadou, 2018; Anagnostopoulou, 2003; Anagnostopoulou, & Samioti, 2013) έχουν δείξει ότι καθένα από αυτά δεν μπορεί να συνδυαστεί µε συγκεκριµένες ρηµατικές κατηγορίες. Ειδικότερα, το επίθηµα –σιµος δεν είναι συµβατό µε αιτιατικά ρήµατα, εναλλάξεις κατάστασης, αιτιατικά/εναλλάξεις κατάστασης, ψυχικού πάθους και ανεργαστικά, το επίθηµα –µένος µε καταστασιακά, εναλλαξιές κατάστασης και ανεργαστικά ρήµατα, και το επίθηµα –τος µε εναλλαξιές κατάστασης, ανεργαστικά και ψυχικού πάθους ρήµατα, τα οποία έχουν το φορέα εµπειρίας σε θέση υποκειµένου. Κατά συνέπεια, σχηµατισµοί, όπως τρέξιµος, τρεγµένος, τρεχτός δεν είναι αποδεκτοί στα Ελληνικά, καθώς ολόκληρο κατασκευάστηκαν µε βάση το ανεργαστικό ρήµα τρέχω.


Η συγκεκριµένη έρευνα αποσκοπεί να εξετάσει περαιτέρω τα µοτίβα αποδεκτότητα των θεµατικών και κατηγορικών παραβιάσεων κάνοντας χρήση ρηµατικών ριζών ποικίλους κατηγοριών (αιτιατικά, εναλλαξιές κατάστασης, αιτιατικά/εναλλαξιές κατάστασης, ψυχικό πάθος είτε µε το υποκείµενο, είτε µε το αντικείµενο ως φορέα εµπειρίας, καταστασιακά, ανεργαστικά, ψυχικά, αντικείµενα σε προθετική φράση), ώστε να αναδείξει λεπτές διαφορές κατά την παραγωγή τους. Ένα on-line πείραµα λεξικής αποδεκτότητα δι ενεργήθηκε. 76 συµµετέχοντες µε µητρική την ελληνική γλώσσα µεταξύ των οποίων και 4 ασθενείς µε λογοπενική πρωτοπαθή προοδευτική αφασία, κλήθηκαν να αποφασίσουν εάν αυτές οι λέξεις είναι πιθανές στα Ελληνικά. Ένα σύνολο 501 λέξεων διαιρέµένο σε δύο λίστες χρησιµοποιήθηκε. Οι λέξεις αποτελούνταν από τρεις κατηγορίες: θεµατικές παραβιάσεις (191 λέξεις), κατηγορικές παραβιάσεις (131 λέξεις) και νεολογισµοί (179 λέξεις). Τα αποτελέσµατα έδειξαν ότι οι νεολογισµοί ήταν οι πιο αποδεκτοί (ποσοστό αποδεκτότητας: 37%), ακολουθούµενοι από τις λέξεις µε θεµατικές παραβιάσεις (ποσοστό αποδεκτότητας: 28%), και από τις κατηγορικές παραβιάσεις (ποσοστό αποδεκτότητας: 9%), επιβεβαιώνοντας κατ' αυτόν τον τρόπο προηγούµενα ψυχογλωσσολογικά αποτελέσµατα. Αξίζει να σηµειωθεί ότι παρουσιάστηκαν ατοµικές διαφορές µεταξύ των επιθηµάτων: λόγω χάρη, όσον αφορά τις θεµατικές παραβιάσεις, για το επίθηµα –σιµος η πιο αποδεκτή ρηµατική κατηγορία είναι τα αιτιατικά ρήµατα (ποσοστό αποδεκτότητας: 54%), (π.χ.: σκοτώνω < σκοτώσιµος), για το –µένος η πιο αποδεκτή ρηµατική κατηγορία είναι αυτή των ρήµατων ψυχικού πάθους µε το υποκειµένο ως φορέα εµπειρίας (ποσοστό
αποδεκτότητας: 47%), (π.χ.: ανησυχώ < ανησυχηµένος), και για το –τος η πιο αποδεκτή ρηµατική κατηγορία είναι τα ανεργαστικά ρήµατα (ποσοστό αποδεκτότητας: 24%) (π.χ.: περπατώ < περπατητός). Σχετικά με τους νεολογισμούς, οι αποδεκτοί συνδυασμοί ήταν εκείνοι με τα δίπτωτα ρήµατα για το –ς (ποσοστό αποδεκτότητας: 49%) και το –τός (ποσοστό αποδεκτότητας: 35%), (π.χ.: εξηγώ < εξηγήσιµος, εξηγητός), ενώ για το –μένος η πιο αποδεκτή κατηγορία ήταν εκείνη των μεταβατικών ρηµάτων (ποσοστό αποδεκτότητας: 47%), (π.χ.: διηγούµαι < διηγηµένος). Όσον αφορά την αξιολόγηση των σχηµατισµών από τους ασθενείς με λογοπενική αφασία, εδείξαν ανάλογη προτιµήση με αυτή του υγιούς πληθυσµού (Νεολογισµοί > Θεµατικές παραβιάσεις > Κατηγορικές παραβιάσεις) με τη διαφορά ότι τα ποσοστά αποδεκτότητας ήταν σταθερά υψηλότερα για όλα τα είδη συνδυασµών. Το γεγονός αυτό πιθανότατα οφείλεται στο ότι παρουσιάζουν δυσκολία στη μορφολογική επεξεργασία των λέξεων. Τα αποτελέσµατα υποδεικνύουν ότι υπάρχει ένα εύρος όσον αφορά την αποδεκτότητα των θεµατικών παραβιάσεων και των νεολογισμών, το οποίο εξαρτάται από τη ρηµατική βάση. Αυτό το εύρηµα εµπλουτίζει την ισχύουσα βιβλιογραφία αποδεικνύοντας ότι τα ποσοστά αποδεκτότητας εξαρτώνται από ειδικές ρηµατικές κατηγορίες. Επιπρόσθετα, τα αποτελέσµατα υποδηλώνουν ότι σχηµατισµοί που χαρακτηρίστηκαν ως παραβιάσεις, σύµφωνα µε τη θεωρία, ήταν ενίοτε πιο αποδεκτοί από τους νεολογισµούς. Το γεγονός αυτό πρέπει να διερευνηθεί υπό το πρίσµα πρόσφατων θεωριών, οι οποίες υποστηρίζουν ότι τα ρήµατα που ανήκουν στο φάσµα της αλλαγής κατάστασης, όπως τα αιτιατικά, δεν μπορούν να συνδυαστούν µε το επίθηµα –ς (Alexiadou, 2018), και τα καταστασιακά ρήµατα, όπως τα ψυχικού πάθους µε το υποκείµενο ως φορέα εµπειρίας δεν µπορούν να συνδυαστούν µε το –μένος (Anagnostopoulou, 2003).
Acknowledgements

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Furthermore, the completion of the current study would not have been achieved without the precious help of Jane Middleton, Anastasia Nousia and Grigorios Nasios, who contributed in the construction of the experiment and the data collection of brain-damaged individuals.
List of Abbreviations

CatViol = Categorial Violation
DVAs = Deverbal Adjectives
NovW = Novel Word
lv-PPA = logopenic subtype of Primary Progressive Aphasia
PPA = Primary Progressive Aphasia
ThemViol = Thematic Violation
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1. Introduction

In recent years research has been conducted about comprehension of denominal and deverbal nouns and adjectives. The class of deverbal formations demonstrate complex morphological structure, consisted of a verbal base and a suffix, and subsequently contains linguistic features that they inherit from their constituents. For deverbal adjectives, such features are the argument structure properties (thematic features), inherited from the base verb and the suffix during their derivation. This fact adds to their complexity, given that the grammatical class of nouns and adjectives do not typically hold thematic features. Moreover, evidence on the role of grammatical class in lexical access and the organization of the lexicon, as well as the role of thematic features in lexical access of verbs, raises questions, such as how the parser will assess this interaction and which of the linguistic features will be found to hold a more fundamental role in the comprehension.

The present study is focusing exclusively on deverbal adjectives and examines the issue from a psycholinguistic and a neurolinguistic point of view, aiming at the same time at coming to general and fundamental conclusions about the processing of deverbal adjectives in Greek and its constituents, the verb categories and the suffixes by healthy and PPA (Primary Progressive Aphasia) individuals, too. For this purpose, suffixes forming deverbal adjectives were put under consideration in combination with a wide range of verb types, as well as non-verbal roots, in order to investigate different kinds of correlations and their implications on comprehension. Particularly, by using a large number of pseudowords containing thematic violations, created by the combination of the adverbial suffixes –menos, -simos, -tos with verbs that are not normally combined with (e.g. ksekin `begin’ [causative/inchoative] < ksekinisimos, ksekinimenos, ksekinitos) and categorical violations, created by the combination of these suffixes with nominal instead of verbal roots (e.g. limni ‘lake’ [no verb] < limnisimos, limnimenos, limnitos), as well as novel words (e.g. diigoume ‘narrate’ [transitive] < diigisimos, diigimenos, diigitos), this study investigates whether and at what extent non-attested adjectives with the suffixes –simos, -tos and –menos, are acceptable in Greek by healthy and PPA patients, too.

The current research attempted to contribute to the existing literature in various ways. Foremost, it is the first time that all three suffixes (-simos, -menos, -tos), which create deverbal suffixes, are analyzed in all their possible combinations. The formulations derived are thematic violations and novel words with multiple verb types, while categorical violations derived from both nouns and adjectives as well. This variety of combinations will bring into light subtle differences among verb categories and at the same time it will highlight the distinct interactions each suffix has with each root type. Subsequently, taking into account a wide range of psycholinguistic factors, such as frequency, root complexity etc., not only those that influence the comprehension, but also those which have less impact on it, will be emphasized. In addition, on the semantic field, regarding the suffixes –menos and –tos, which have two possible meanings: -menos formations mean target or result, and –simos has either the meaning of ability or state, a clarification of acceptance between the two is expected to be achieved. Moreover, the upcoming results will provide us with further evidence or they will disprove existing linguistic theories on the syntax and psycholinguistic field.
Finally, the assessment of lv-PPA patients, who have been proved to process the verb’s argument structure features properly in most of the cases is expected to show how they process complex words containing these features.

The fundamental goal of the present study is to bring into the fore those argument structure properties that influence the comprehension of the deverbal adjectives by healthy and brain-damaged populations (PPA). Using the suffixes –tos, -menos and -simos and considering their syntactic and semantic properties, a large corpus of pseudowords was constructed in order to detect to what extent the lexical formations that violate the attachment constraints of the above suffixes are accepted with regard to the argument structure (Thematic violation) and the lexical category (Categorical violation). The basic hypothesis of the research was to investigate whether the parser is indeed sensitive in finer grained semantic information or information of structure category and if it differentiates in percentage of acceptance.

2. Theoretical background

The complex nature of the deverbal adjectives coming from inherited thematic properties of the verb was mentioned above. Thus, it is essential to look closely to the process of their derivation. In this chapter I describe the morphological process with which derived words, and particularly deverbal adjectives, are constructed. In addition, the constituents of deverbal adjectives in Greek, the verb roots and the suffixes, and their features are presented extensively.

2.1. Morphological processes

Complex words are formed by the operations of inflection, derivation and compounding. Derivation involves the adding of a derivational affix on the word stem, but this action leads to the creation of a different grammatical category of a word (e.g. read [verb] > read-er ‘the person who reads’ [noun]). This means that derivational affixes do not hold morphosyntactic features and grammatical information, but semantic, as they are able to form a new meaning from the initial root (Bauer, 2008; Booji, 2013). In addition, both the stem and the suffix carry thematic features, which contribute to the derived word. Thus, when it comes to derivation the argument structure properties of both the constituents need to fit with each other.

According to lexicalist theories of Bauer 2001, Plug 1999, 2003 and Ralli 2005, cited by Manouilidou (2006:34), it seems that there are some morphological constraints arising from the interaction of morphology with other grammar fields, for instance, phonology, syntax or semantics, and are applied universally to derivational procedures. These constraints are divided into weak and strong constraints. A strong constraint refers to a morphological process in which an affix is combined exclusively to a particular root base, such as the suffix –tis in Greek, which attaches only to agentive verbs (e.g. klevo ‘steal’ < klef-tis ‘thief’). A weak constraint, one the other hand, expresses a morphological process, where an affix has a tendency to be attached in a certain type of root, such as the english suffix –er, which attaches mainly to agentive verbs (e.g. teach < teacher), but it can also be found to non-agentive verbs (e.g. hear < hearer), and nouns (e.g. village < villager).
More specifically, regarding deverbal word formation, a process involving the combination of a verbal root with an affix, the compatibility of the affix with a verb stem consists a strong constraint, in Bauer terms, as it defines the whole morphological operation. Therefore, the constraint referring to the grammatical category of the root to which the affix is attached, is called categorical and its violation, \textit{categorical violation}, e.g. \textit{limni} ‘lake’ \textless \textit{limnitos}. One the other hand, the constraint referring to the verb type of the root to which the affix is attached, is called thematic and its violation, \textit{thematic violation}, e.g. \textit{ksekino} ‘begin’ \textless \textit{ksekinitos}. In Greek, affixes formulating deverbal nouns or adjectives are subject to strict constraints regarding both categorical and thematic features of the verbal root (Manouilidou, 2014).

According to Ralli (2005), cited in Manouilidou (2006:174), the closer to syntax sublevel the processes are taking place the more predictable, more productive and more regular they are, instead of taking place at a sublevel closer to the lexicon, which contains lemmas with non-predictable features. This means that it is the proximity to the root which determines the stringency of the constraint. So, the categorial constraints which applied closer to the verbal root at a higher level are more rigid, whereas the thematic ones surfacing at a lower level closer to the word level appear to be more violable.

However, this kind of information is necessary only for word formations with an intense eventive character. Hence, the access of lexical representations is a procedure reached in stages, with the decomposition preceding the elaboration of thematic features. As the decomposition is taken place at first, the parser is impossible to skip the thematic component in the word identification process, an action which is not applied to existing words (Manouilidou, 2006). Therefore, taking into consideration the fact that processing specifications is a procedure similar to word formation and that the thematic properties are accessed after of those grammatical category’s, it can be pointed that the application of distinct constraints is a sequential procedure, in which the thematic constraints are applied after the categorical ones (Manouilidou, 2006).

The main issue in this study is the examination of deverbal formations, and especially deverbal adjectives. In any deverbal formation the argument structure properties inherited from the verb affect the comprehension of the derived lexical item (Manouilidou, 2006). Therefore, there is a need to clarify the term \textit{argument structure}, in order to understand more specifically how its properties influence the comprehension deverbal formations.

\section*{2.2. Argument structure}

The term “argument structure” is used to refer to the lexical representation of argument-taking lexical items—typically verbs, but also nouns (especially nominalizations), adjectives, and even prepositions—that specifies sufficient information about these items’ arguments to allow their syntactic realization to be determined. Another useful kind of information that is included in the mental lexicon and it is also part of the argument structure, is whether each word chooses to have complements and what kind of complements it chooses to take. This information is given by the subcategorization frame, which is expressed at the level of phrasal
structure through the Projection Principle (Chomsky, 1981). An argument structure typically indicates the number of arguments a lexical item takes (e.g., the core participants in the eventuality a verb denotes), their syntactic expression, and their semantic relation to this lexical item (the thematic roles) (Alsina, 2006). For example, the verb /tróo/ ‘to eat’ has the argument structure: <Agent<Theme>>, that shows that the verb has two arguments, one external, which is the Agent in the position of the subject, and one internal, which is the Theme in the position of the object.

According to their argument structure and their semantic content, verbs are classified in distinct categories. Each one of them bears specific morphosyntactic features, Hence, it is necessary to clarify these properties, since the present study has used a variety of verb types.

2.3. Verb categories

2.3.1. Transitive verbs

Transitive verbs consist the largest verb category. As ‘transitive’ are characterized the verbs that take an object as a complement, which has usually the thematic role of the Theme and it is in the accusative case, with the subject being the Agent of the act, e.g. “O Nikos troi makaronia” ‘Nick eats spaghetti’. Nikos is the subject and the Agent, and makaronia is the object and the Theme.

2.3.2. Ditransitive verbs

Ditransitive verbs are the verbs that take two objects: one direct in accusative and one indirect in dative or genitive case. Usually the second indirect object is not obligatory, e.g. in the sentence “O Nikos edose to vivlio sti Maria” ‘Nick gave Mary the book’. Nikos is the subject and at the same the external argument carrying the thematic role of the Agent, while to vivlio and sti Maria are the two objects: to vivlio consists the direct object and the Theme, whereas sti Maria is the indirect object having the thematic role of the Recipient of the action and it is optional, because the sentence could also be “O Nikos edose to vivlio”.

2.3.3. Causative verbs

Causative verbs’ structure is [cause someone/something to sustain what the verb root means], consequently changing the state of the object and having syntactically a transitive structure. (Gropen, J., Pinker, S., Hollander, M., & Goldberg, R., 1991). For example, the argument structure of the causative verb skotóno ‘kill’ is <Agent<Theme>>, with the Agent being the external argument and the Theme the internal argument, e.g. the sentence “O Nikos skotose to puli” ‘Nick killed the bird’ is decomposed as “Nick caused the bird to be killed/die”: meaning that the bird was alive and Nick changed its state to dead.

2.3.4. Inchoative verbs

Inchoative verbs’ definition is similar to the causative’s with the only difference that the inchoatives lack a causing agent and the verb occurs spontaneously. Also, their syntactic structure is generally intransitive containing, however, a change of state, but not a specific time reference, whereas an adverbial or a modal element is not
necessary (Haseplamth, M., 1993), (Levin, B., 1993). For example, the argument structure of the inchoative verb *megalóno* ‘grow’ is <Theme>, with the Theme being the internal argument, e.g. the sentence “Ta luludja megalosan” ‘Flowers have grown’ means that the flowers were short and now their state has changed and they are bigger than before, but, at the same time, it implies the absence of the agent in this act, showing that the flowers have grown by themselves or by a natural factor.

The majority of the inchoative verbs in Modern Greek is formulated by the annexation of a verbalizer to the root, which is usually an adjective, just like in the cases of *vaθ-éno > vaθ-is* (adj. deep) and *sten-évo > sten-ós* (adj. narrow), or occasionally can also be a noun, e.g. *pag-óno > pág-os* (n. ice, frost).

2.3.5. Causative/inchoative verbs

Causative/inchoative verb category or as it is widely known ‘causative altern’ or ‘unaccusative’ or ‘anti-causative’ or ‘ergative’ is created by the combination of the above two verb classes. The verbs that undergo this alternation are characterized as verbs of change state, but, combining elements both from the causative and from the inchoative verb class, they have both a transitive and an intransitive structure and therefore two different argument structures, one containing an agent and another that does not (Levin, B., 1993) For instance, the argument structure of the verb *spáo* ‘break’ is: <Agent<Theme>>, e.g. “O Nikos espase to vazo” ‘Nick broke the vase’, means that the Agent, which is the subject of the sentence (Nikos), and alongside the external argument, caused the Theme, which is the object of the sentence (to vazo), and the internal argument, to become what the verb means, that is to break: and <Theme>, e.g. “To vazo espase” ‘The vase is broken’, means that the vase has become broken but it is not defined if there was someone who caused that state (e.g. an agent) or it happened spontaneously by probably a natural cause (e.g. the wind) and how this fact has happened (e.g. adverbial, modal element).

2.3.6. Psychological state verbs (psych verbs)

Psych verbs typically take two arguments: the Experiencer and the Theme or Object of Emotion. They are divided into two main categories depending on their argument structure and especially on the syntactic position of the thematic role of the Experiencer.

2.3.6.1. Psychological state verbs with the Experiencer on the Object position (Psych ObjExp)

Psych ObjExp verbs describe the elicitation of a change in a psychological situation or emotion. Their syntactic form is transitive and their structure is: <Agent/Cause<Experiencer>> (Levin, B., 1993). For example, the sentence “O Nikos apoyoitefse ti Maria” ‘Nick disappointed Mary’ means that the subject of the sentence, which is also the Agent of the act (Nikos) caused disappointment to the object of the sentence, which is therefore the Experiencer (Maria), as it is the one who experiences the notion of the verb, the disappointment.

2.3.6.2. Psychological state verbs with the Experiencer on the Subject position (Psych SubExp)
Psych SubExp verbs can either be transitive or intransitive and they are referred to an emotional or psychological state that is experienced by the subject of the sentence (Levin, B., 1993). In their transitive form psych Subexp verbs’ argument structure is: <Experiencer<Theme>>, e.g. 

\[ \text{ayapó} \text{ ‘love’} \]. So, in the sentence “\textit{O Nikos ayapa ti Maria}” ‘Nick loves Mary’ the subject of the sentence (\textit{Nikos}) is the one who experiences the meaning of the verb, the love. Their intransitive substance characterizes of an argument structure consisting of an Experiencer and an Object of emotion in a prepositional phrase, e.g. \textit{cherome} ‘be glad’. Accordingly in the sentence “\textit{I omáda cherete ja ti niki tis}” ‘The team is glad for its win’ the subject of the sentence (\textit{I omada}) takes at the same time the thematic role of the Experiencer of the verb notion, the joy, whereas the verb takes its object/cause of emotion in a prepositional phrase beginning with the preposition “\textit{ja}” ‘for’.

2.3.7. Unergative verbs

Unergative verbs, also known as intransitive, are verbs that do not take an object as a complement, e.g. \textit{tréxo} ‘run’. So, they have only one argument, which is external and their argument structure is: <Agent>, e.g. “\textit{O Nikos trechi}” ‘Nick runs’.

2.4. Suffixes

Deverbal adjectives in Greek are formed with the suffixes \textit{-simos, -tos}, which are equivalent to the English ‘able’ and \textit{–menos}, that forms the adjectival participle. These all suffixes require only verbal stems and more specifically each of these has constraints as about the kind of verb roots they are attached to.

2.4.1. -menos

The adjectival participle with \textit{–menos}, which traditionally encloses a passive meaning due to its original derivation from the Present Perfect, is closer to passive participle rather than the perfect participle and entails two states, the target and the resultant one. The first describe a reversible state (e.g. krimenos ‘hidden’), whereas the second are referred to a state that holds forever after the event that caused it (e.g. vrazmenos ‘boiled’). In a sentence context, the target state participles can be found near the adverb \textit{akoma} ‘still’, while the resultant cannot (Anagnostopoulou, 2003), (Anagnostopoulou, & Samioti, 2013).

\[ \text{e.g. Ta pedja ine \textit{akoma} krimena} \]

‘The children are still hidden’

\[ *\text{Ta makaronja ine \textit{akoma} vrazmena} \]

‘The spaghetti are still boiled’

Furthermore, the target state participles are not compatible with agent and instrument prepositional phrases, unlike the resultant state participles:

\[ *\text{Ta pedja ine krimena \textit{apo ti mama tus}.} \]

‘The children are hidden by their mother’

\[ \text{Ta makaronja ine vrazmena \textit{apo ti mama}.} \]
'The spaghetti are boiled by mother'

At this point, it is crucial to distinguish between adjectival and verbal passive participle considering the eventuality of a possible confusion betwixt the two. Adjectival passive participle, which is the one that concerns us at this research, can be found in a pronominal position (e.g. θlimeno pedi ‘the sad child’), and can consist complements of verbs, like γινομενε ‘become’, γενομενε ‘seem’, γεραμενε ‘remain’ (e.g. Fanike enoxlimenos ‘He looked annoyed’). Moreover, there is a pure syntactic discrimination based on the position of the participial morphology in the syntactic tree. The adjectival passive affix has the V as its sister, while the verbal passive affix adjoins to the VP, as it is presented below (Anagnostopoulou, 2003):

\[
\begin{array}{c}
\text{Lexical Affixes} \\
\text{Phrasal Affixes}
\end{array}
\]

\[
\begin{array}{c}
V \quad Z' \\
\text{participle affix} \\
\text{VP} \\
\text{Z'} \\
\text{participle affix}
\end{array}
\]

Consequently, the –menos participles are also divided by their syntactic structures according to a Distributed Morphology – based decomposition framework (Alexiadou & Anagnostopoulou, 2008):

The target state participles, which comprise an implication of an event and thus do not license by-phrases meaning the agent or the instrument, have a v attachment (v is regarded to be the eventizing head):

\[
\begin{array}{c}
\text{Asp} \\
\text{v} \\
\sqrt{\text{KRIV}} \\
\text{‘hide’}
\end{array}
\]

On the other hand, the resultant state participles, which include both implication of an event and an agent, and therefore license by-phrases contain a Voice attachment (Voice is considered to introduce the external argument) having always a meaning derived by the corresponding verb:

\[
\begin{array}{c}
\text{Asp} \\
\text{Voice} \\
\text{men} \\
\text{\sqrt{\text{VRAZ}}} \\
\text{‘boil’}
\end{array}
\]

This leads to the conclusion that –menos forms of outer affixation by telic and some atelic verbs, while it is also systematically present with verbs that contain a verbalizer (-iz, -on-, -en/an, -ev, -az, -a), id est have a complex root, which with the presence of the verbalizer has gained an event meaning. So, -menos is not combined with state verbs (e.g. ksero ‘know’ < *kseromenos ‘knowed’) and psychological verbs (e.g. thelo ‘want’ < *thelimenos).
2.4.2. -simos

Alexiadou (2018) named these structures low and high –able respectively and suggested that according to the prior, word formation out of roots is characterized by low productivity and unpredictability in form and meaning, while the later is related to a word formation out of words, which is regular and predictable in both form and meaning. According to Alexiadou the suffix –simos has a high –able structure, which means that it can be combine with by-phrases and manner adverbs, as well as aspectual phrases:

To vivlio ine katanoismo apo tus maθites.

‘The book is understand-able by the students’

To vivlio ine efkola katanoismo.

‘The book is easy understand-able’

To vivlio ine katanoismo apo ta prota lepta.

‘The book is understand-able from the first minutes’

Based on this fact, Alexiadou concluded that -simos cannot derive adjectives out of predicates that cannot combine with Middle Voice. In addition, Alexiadou, Anagnostopoulou & Schäfer (2015) observed that several verbs that undergo the causative alternation do not have the capacity to combine with non-active morphology, in order to form a passive, for instance, the causative verb *spao ‘break’ does not have a passive. This phenomenon occurs also with the inchoative verbs, which are not allowed to combine with a non-active ending, e.g. *krionome, as well as with verbs that can be attached to a passive morphology but they cannot receive a passive interpretation, as they are not compatible with agentive by-phrases, e.g. *ceo ‘burn’, *skotono ‘kill’, *kovo ‘cut’.

I Maria kopike me to macheri/*apo to macheri.

‘Mary was cut with the knife/*by the knife.’

The above observations lead to the conclusion that -simos is not attached to causative (e.g. spao ‘break’ < *spasimos ‘breakable’), inchoative (e.g. pagono ‘frozen’ < *pagosimos ‘frozenable’), psychological (e.g. agapo ‘love’ < *agapisimos ‘loveable’) and unergative (e.g. treho ‘run’ < *treksimos ‘runable’) verbs.

2.4.3. -tos

Suffix –tos in Greek produces pure stative participles, which are characterized by the lack of the implication of a prior event, by attaching directly to the verb root (inner-cycle attachment) (Anagnostopoulou, & Samioti, 2013; Anastasiadis-Symeonidis, 1995). Due to its direct bond to the root it is usual for –tos to form participles which do not to have a contextual meaning, but an idiosyncratic one (The Idiosyncrasy Generalization).

O Nikos ine klistos anθropos.
‘Nick is a closed (=shy) person.’

Moreover, the absence of an event implication affects the syntactic properties of the –
tos participles, as they cannot license manner adverbs, by-phrases and instrument
prepositional phrases.

*To vivlio ine grigora grapto.
‘The book is fast written’

*To vivlio ine grapto apo ton singrafea.
‘The book is written by the writer’

*To vivlio ine grapto me molivi.
‘The book is written with pencil.

A confusing observation about the suffix –tos is that it can be combined to either
complex and non-complex verb roots, roots with verbalizers and without. So, taking
into consideration the Marantz (2013) classification of roots, which supports that
verbal roots modify events, adjectival roots modify states, and nominal roots modify
entities, resulting that –tos prefers verbal (event) elements to be added to, while it
cannot be attached to the following categories of roots:

Root_{nominal} + verbalizer, e.g. koumb-i ‘buttonN’ < koumb-on-o ‘buttonV’ < *koumb-o-
tos ‘buttoned’.

Root_{adjectival} + verbalizer, e.g. aspr-os/i/o ‘white’ < aspr-iz-o ‘whiten’ < *aspris-
tos.

Nevertheless, there are some exceptions to the above generalizations, such as, kokin-
os/i/o ‘red’ < kokin-iz-o ‘redden’ < kokin-is-tos ‘with a red sauce’. In conclusion, –tos
is not added to inchoative (e.g. pagono ‘frozen’ < *pagotos), psychological verbs that
have the Experiencer in the subject position (e.g. thelo ‘want’ < *thelitos) and
unergative verbs (e.g. kolimbo ‘swim’ < *kolimbitos).

On the other hand, the ability/possibility meaning of -tos, is connected with an outer-
cycle attachment above Voice and the existence of agentive and instrumental
prepositional phrases, as well as agent-oriented adverbs, contrary to the state meaning,
that was referred previously (Anagnostopoulou, & Samioti, 2013), (Anagnostopoulou,
& Samioti, 2014).

To maθima ine katanoito apo olus.
‘The lesson is understandable by everyone’

To maθima ine γρίγορα katanoito.
‘The lesson is fast understandable’

To maθima ine katanoito me to mnalo.
‘The lesson is understandable with the mind’

2.5. Summary
In the above sections we have described the derivation and the constituents of the deverbal adjectives that will consist the experimental material of the present study. Although the derivational process is similar for all suffixes, there are differences concerning various constraints. Each suffix’s syntactic and semantic properties allow the attachment to certain types of stems. A fundamental constraint is that of the grammatical category of the root, which has to be verbal. The infringement of this strong constraint results to categorical violations. The other kind of constraint involves the thematic features of the verbal root. For instance, the suffix –_simos_ is not compatible with causative, inchoative, causative/inchoative, psych and unergative verbs, the suffix –_menos_ with state, inchoative and unergative verbs, and the suffix –_tos_ with inchoative, unergative and psych verbs having the experiencer as subject. Hence, that kind of combinations creates thematic violations.

Nonetheless, when it comes to the processing of the deverbal adjectives, other psycholinguistic properties, such as the frequency, the number of letters, the number of phonemes, the root complexity, etc., must be taken into account. Therefore, the comprehension of that kind of formations it is a complicated procedure, as the thematic features have been proved to be an effective factor on processing of deverbal words (Manouilidou, 2006). This issue is addressed in the following chapter.

3. Psycholinguistic Background

In this chapter the main psycholinguistic theories about lexical access and the morphological processing of words are summarized. Apart from that, current studies about the mental lexicon and its role in morphological processing, as well as the latest research conducted about deverbal adjectives in Greek are presented below. Thus, in this chapter the necessary background will be provided, in order for the experimental procedure of this study to be thoroughly understood.

3.1. Morphological Processes

A large number of studies has been conducted, in order to investigate the way words are mentally processed. Specifically, concerning complex words different psycholinguistic theories have been put forward, in an attempt to understand whether they are processed through decomposition into their constituents or as whole words.

3.1.1. Decomposition Model

According to Decomposition Model, complex words are stored in the lexicon per morphemes and therefore their lexical access takes place after the word is being decomposed into its morphemes. This theory suggests that a greater economy is achieved if one root is stored in the lexicon, rather than the root together with all its derivatives (Taft & Foster, 1976). This kind of organization allows for semantically related words to be listed near each other, even if the lexicon is organized orthographically or phonologically. However, this model has been failed to consider how complex morphological structure interacts with other lexical features of the whole word and its constituent morphemes, such as frequency and transparency.

3.1.2. Whole-word Model
According to the whole-word model, as it was suggested by Butterworth (1983), the lexicon is a list of words, both regular and irregular, and hence every lexical item is accessed as a whole entity without decomposition into its constituents. This theory constitutes the only explanation for idiosyncratic meaning, but it does not seem valid for derivatives that have predictable meaning emerging from their components. Concerning the latter fact, Butterworth argues that there are some lexical rules, which are applied to some lexical items.

Not surprisingly, neither of the main two word-processing models is totally accepted, as experimental research has provided evidence for both of them depending each time on the experimental material (examined words) and other psycholinguistic factors, such as frequency. An intermediate position, therefore, seems to be the most applicable, in order to include all the cases of lexical items.

3.1.3. Dual access Models

Dual access models are called those models supporting that the lexicon stores words in two ways, both as separated morphemes and as whole words. This kind of models takes into consideration a variety of linguistic properties of the words (phonological, morphosyntactic etc.) that could possibly have an impact on word processing.

Such a model is the one proposed by Schreuder & Baayen (1995), which takes into account a great number of linguistic factors examining their possible ways of interaction. More specifically, it states that morphological processing is divided in three stages: segmentation, licensing and combination. **Segmentation** is the matching of the lexical item to an access representation. **Licensing** is called the procedure in which the active representations of the affixes and the stem are inspected in light of grammatical combinability. **Combination** is called the process where the syntactic and semantic properties of the combination of the stem and affixes are computed, and it is identified by an Anterior Midline Field (AMF) response in the left ventromedial and inferior prefrontal cortex (Wallis, 2007; Hahne & Friederici, 1999; Hahne & Jescheniak, 2001 ). Finally, an extremely useful mechanism is the **activation feedback**, as it allows the activation of all levels of processing to be affected by all the rest levels.

A lexical representation consists of a **concept node**, which is connected to syntactic and semantic representations. For instance, the lexical representation for an inflected form such as *tables* should be connected to three conceptual nodes. One node represents the meaning of TABLE, one represents the meaning of Plural and one stands for information associated with the grammatical class of Noun. When it comes to the processing of complex words, firstly, the stimulus is conveyed into an intermediate access representation, which includes more than one alternative choice, usually this one in which the word is processed as a whole, or another in which is decomposed into its constituents. Consequently, these representations are mapped onto the access representation proper, which is linked to one or more lexical representations. The recognition of a lexical item demands the activation of its individual nodes, which are influenced both by their syntactic and semantic representations and by other words having the same syntactic and semantic features. As soon as the activation of concept node is achieved, it is checked whether the syntactic and semantic representations allow the combination. In case that the
licensing has been given by the syntactic node, the computation of the meaning of the complex word needs to be done. Finally, the parser has to reach the lexical representation consisted of a concept node and its syntactic and semantic representations.

The latter morphological processing model of Schreuder and Baayen is the one that has been adopted by the current study, as it sets under consideration various linguistic features that can possibly affect lexical access, such as root frequency, word frequency and productivity. Moreover, it takes into account semantic and syntactic properties of each word and it examines the way they can probably interact with each other in the lexical access procedure.

3.2. Mental Lexicon

The interpretation of the deverbal adjectives, therefore, depends on the meaning of both the verb roots and the suffixes, information which is located in the mental lexicon. The mental lexicon is considered to contain information about the phonological, morphological, syntactic and semantic properties a word carries. Hence, except from the meaning, the speaker has stored information also about the mechanisms and the circumstances each suffix is or can be combined with a verb root. Therefore, the syntactic and semantic properties of each suffix do not allow to it to be attached anywhere, but to certain verb roots. The combinations, that diverge from the formulation rules each suffix has, create violations (e.g. ksekino ‘begin’ [causative/inchoative] < ksekinisimos, ksekinimenos, ksekinitos), limni ‘lake’ [no verb] < limnisimos, limnimenos, limnitos).

In addition, mental lexicon seems to play a central role in morphological processing as it connects lexical items with the syntactic and semantic interpretation of the conveyed message during the comprehension and production processes. Hence, taking under consideration the information stored in it, phonological, morphological, syntactic and semantic properties of lexical items, findings about subtle aspects of lexical representation can be drawn (Manoulidou, 2006).

Besides this information, grammatical class has been proved to figure an important role to the lexical access, as the mental lexicon is considered to be organized around it. In particular, concerning the grammatical class of the verb, the argument structure of the verb and its thematic features are accessed directly upon a verb encounter (Mauner & Koenig, 1999). Thus, in the case of deverbal adjectives, which are adjectives that have inherited the features, and more specifically, the thematic information of their base verb is combined with this of their suffix, the factors influencing the comprehension of these adjectives interact with each other interestingly in many possible ways.

3.3. Processing of Deverbal Adjectives

The investigation of deverbal word formation revealed the crucial role of thematic features in the processing of deverbal nouns and adjectives, as they are accessed at the same time with also semantic and syntactic information of the verbal root, as it was pointed by Bencini & Goldberg, 2000; Friederici & Frisch, 2000,cited by Manouilidou (2006:33) Specifically, Manouilidou (2006) states that the thematic features of the verb stem influence deverbal words, which are characterized by high eventive (verbal) properties (e.g. katedafisimos ‘demolishable’), on contrary to words with less verb-like features (e.g. katakritis ‘conqueror’, skalistos ‘engraved’). In the
In the case of the suffix –tos, it seems that the adjectives formulated with this suffix do not license syntactic realization, i.e., although the semantic participants are part of the lexical entry, they are not active as arguments. Generally, the research proved that the number of the arguments does not hold a primary role to the access of deverbal nominals, a fact ascribed to the less obligatory presence of the semantic participants’ syntactic realization in denominals compared to verbs.

Moreover, it was found that speakers judge differently words containing thematic violations comparing to words with categorical violations, while the thematic features of a word are processed after the whole word interpretation. However, it was also found in either the case that a deverbal adjective is processed as a whole word (like those formed with –tos) or it is decomposed into its constituents, it is accessed similarly. The research indicated that the lexical access route and the quality of deverbal words, in the terms to which extent they have eventive properties or not, are those which affect the lexical processing.

More specifically with regard to deverbal adjectives, Manouilidou et al. (2007) proceeded to the fact that only deverbal adjectives, in contrast with nominal adjectives (e.g. vrohi ‘rain’ < vroheros ‘rainy’) and non-derived adjectives (e.g. thetikos ‘positive’), carry the thematic features inherited from their verbal roots and from which are affected during the access. However, in the case of deverbal adjectives, it appears that thematic features do not hold an important role contrary to other kind of information at least in the mental representation of non-decomposed types of deverbal adjectives, such as those constructed with the suffix –tos, which have been proved to accessed as whole words (Manouilidou, 2006).

Laying into comparison the two kinds of violations, categorical and thematic, Manouilidou & Stockall (2014) in a study containing pseudowords with both the violations in Greek and English language, found that the syntactic category information is processed before the argument structure information, which carries the thematic features. The results were common in both the languages and pointed to a universal way of processing complex pseudowords. Making the assumption that the access levels correspond to the representation levels, it can be claimed that in word formation the thematic constraints apply after the categorical constraints. So, the word formation process is similar to lexical access.

Neophytou et al. (2018) in an attempt to understand the neurocognitive processing of morphologically complex words in Greek provided evidence supporting the Full Decomposition model. In this research, all three suffixes, -simos, -menos, -tos, were examined in the form of grammatical and ungrammatical words. The latter ones included categorical (e.g. varel-imos ‘barrel-able’) and thematic violations (e.g. gela-simos ‘laugh-able’), derived by unergative verbs. It was proved that the thematic violations demanded more time than the categorical to decide whether or not are accepted, whereas the two kinds of violations were parsed into distinct brain areas: the categorical violations were processed in left Temporal Lobe (TL), where the syntactic licensing takes place, whilst the thematic violations were processed in left Orbitofrontal (OF) Cortex, an area that has to do with semantic decomposition and
interpretation. The two operations found to be consecutive as the syntactic licensing preceded the semantic decomposition.

Figure 1: Post-Decomposition Stages of Processing Morphologically Complex Words

Concerning the acceptability, thematic violations were more easily passed to the second stage of semantic interpretation than the categorical, and therefore found to be more acceptable. Nevertheless, differences among the three suffixes were detected, possibly corresponding to grammar differences.

In the preceding sections the main psycholinguistic models for words’ processing were discussed. Furthermore, previous studies investigating the comprehension of deverbal adjectives were reviewed. In sum, the processing of deverbal adjectives is a procedure reached in stages with the decomposition to take place at first. Therefore, information, such as the grammatical category of the root and the thematic features of the verbal stem, is not only accessed, but also found to influence the comprehension. However, the former studies included only one kind of violations, for instance – simos+unaccusatives, -menos+unergatives, whereas this research examines the whole range of suffixes and verb categories. The same question is going to be examined, also, in novel words, which do not violate any constraint.

4. Method

4.1. Experiment 1: Grammatical judgment task by healthy population

4.1.1. Participants

Seventy-two (71) native speakers of Modern Greek participated in the study. Sixty seven (67) of them were healthy adults at the age between 20-60 years old.

4.1.2. Apparatus/Materials

In this study a wide spectrum of verbal, nominal and adjectival roots was used, in order to examine whether there is a difference between all possible formulations in light of acceptance. A large amount of pseudowords, deverbal adjectives (DVAs) in particular was constructed. The suffixes –simos, -tos, -menos, therefore, were
combined with roots of verbs that are not normally combined, as well as roots of
nouns and adjectives, creating both thematic and categorical violations. Novel words
were also constructed by combining the suffixes with verb roots that do not underlie
any constraint.

In sum, 501 words, including thematic violations, categorical violations and novel
words, were created and subsequently were conveyed to GORILLA program, which
was used to design the experiment.

4.1.2.1. -simos Thematic Violations (ThemViol)

Formed by adding the suffix –simos to causative/inchoative, causative, inchoative,
psych and unergative verbs.

1. Causative/inchoative
   Example: ksekino ‘begin’ > ksekinisimos
2. Causative
   Example: katastrefo ‘destroy’ > katastrepsimos
3. Inchoative
   Example: pagono ‘frozen’ > pagosimos
4. Psych Subject – Experiencer
   Example: ipofero ‘suffer’ > ipofersimos
5. Psych Object – Experiencer
   Example: sinxizo ‘confuse’ sinxisimos
6. Unergative
   Example: perpato ‘walk’ > parpatisimos

4.1.2.2. -simos Categorical Violations (CatViol)

Categorical violations with –simos were made by adding this suffix to non-verb roots
(nouns and adjectives).

Example: kefali (noun) ‘head’ > kefalisimos
   aspros (adjective) ‘white’ > asprosimos

4.1.2.3. -simos Novel Words (NovW)

-simos is attached to transitive verb roots, so the novel words with –simos were
formed by adding the suffix to verb roots that there is not a constraint to be attached
to. Consequently, -simos was attached to three kinds of verb roots: transitive,
ditransitive, perception.

Example: 1. Transitive: sinanto ‘meet’ > sinantisimos
   2. Ditransitive: grafo ‘write’ > grapsimos

4.1.2.4. -tos Thematic Violations (ThemViol)

Formed by adding the suffix –tos to causative, psych and unergative verbs.

Example: 1. Causative/inchoative: allazo ‘change’ > allachtos
2. Inchoative: pagono ‘frozen’ > pagotos
3. Psych Subject – Experiencer: pono ‘pain’ > ponitos
4. Unergative: perpato ‘walk’ > perpatitos

4.1.2.5. -tos Categorical Violations (CatViol)

Categorical violations with -tos were made by adding this suffix to non-verb roots (nouns and adjectives).

Example: kefali (noun) ‘head’ > kefalitos
aspros (adjective) ‘white’ > asprotos

4.1.2.6. -tos Novel Words (NovW)

-tos is attached to transitive verb roots, so the novel words with -tos were formed by adding the suffix to verb roots that there is not a constraint to be attached to. Consequently, -tos was attached to three kinds of verb roots: transitive, ditransitive, psych object - experiencer.

Example: 1. Transitive: sinanto ‘meet’ > sinantitos
2. Ditransitive: charizo ‘donate’ > charistos
3. Psych object – experiencer: epireazo ‘affect’ > epireastos

4.1.2.7. -menos Thematic Violations (ThemViol)

-menos is attached mainly to transitive verb roots, while it is attached to state verb roots. Therefore, its violations were built by adding the suffix to 5 verb categories:

1. Causative/inchoative: archizo ‘begin’ > archimenos
2. Inchoative: thermeno ‘warm’ > thermasmenos
3. State: omologo ‘admit’ > omologimenos
5. Unergative: chorevo ‘dance’ > chorevmenos

4.1.2.8. -menos Categorical Violations (CatViol)

Categorical violations with -menos were made by adding this suffix to non-verb roots (nouns and adjectives).

Example: kefali (noun) ‘head’ > kefalomenos
pseftikos (adjective) ‘fake’ > pseftikomenos

4.1.2.9. -menos Novel Words (NovW)

-menos is attached to transitive verb roots, so the novel words with -menos were formed by adding the suffix to verb roots that there is not a constraint to be attached to. Consequently, -menos was attached to three kinds of verb roots: transitive, ditransitive, perception.

Example: 1. Transitive: sinanto ‘meet’ > sinantimenos
2. Ditransitive: dichno ‘show’ > dichmenos
3. Perception: akuo ‘hear’ > akusmenos

These non-words were subsequently constituted the basis of the experiment, which was an on-line lexical decision task.

The results were evaluated under the light of many psycholinguistic factors, such as the number of letters, the number of phonemes, the number of syllables, the phonological and orthographic neighbors, the phonological and orthographic cohort and finally the frequency of the root. These factors are considered to possibly affect the participant’s judgment, as it has been shown by previous studies (Kordouli et al., 2018). For instance, a formation of a root with high frequency or with small number of letters is more possible to be accepted than a formation of a root with low frequency and large number of letters.

4.1.3. Procedure

The experiment was conducted on-line. The participants were asked to evaluate these words, which were given to them randomly, as if they are acceptable 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.

4.1.4. Results

The survey results were examined under various parameters and many correlations were made.

4.1.4.1. Overall results

Firstly, concerning the variable of condition, the results showed a clear preference for the novel words (37%) with the thematic violations following (28%) and afterwards the categorical violations following (9%). The findings are summarized Table 1 below.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thematic Violations</td>
<td>0.284</td>
<td>0.005</td>
</tr>
<tr>
<td>Categorical Violations</td>
<td>0.091</td>
<td>0.006</td>
</tr>
<tr>
<td>Novel words</td>
<td>0.371</td>
<td>0.005</td>
</tr>
</tbody>
</table>

4.1.4.2. Correlation between condition and suffix

Furthermore, additional analyses taking into consideration the suffix variable revealed more detailed differences, since a main effect of condition (p. < .001) and a main effect of suffix (p. < .001) was revealed [F(4)= 19.366, p. < .0001], leading to an interaction between condition and suffix.

Graph 1: Mean Acceptance Rate per Condition and Suffix.
For categorical violations, the mean acceptance rate was around 0.1 (10%) and formations with the suffix –menos were the most acceptable (Mean: 0.102, SD: 0.011), while formations with –simos (Mean: 0.092, SD: 0.011) and –tos (Mean: 0.082, SD: 0.009) were following. Further comparisons showed a significant difference between the three kinds of categorical violations (p. < .0001).

When it comes to thematic violations, formations with the suffix –simos found to be the most accepted of the three (Mean: 0.335, SD: 0.007), then were the formations with –menos (Mean: 0.302, SD: 0.010), and finally the formations with –tos (Mean: 0.179, SD: 0.010), while the comparisons revealed a significant different between the three (p. < .0001).

Finally, for novel words, the suffix –menos seemed to be the most acceptable (Mean: 0.430, SD: 0.012), which is followed by –simos (Mean: 0.424, SD: 0.008), and then by –tos (Mean: 0.295, SD: 0.008), whereas these results are characterized by a significant difference between the formations of the three suffixes (p. < .0001).

In addition, a test of within subjects effects was conducted, which showed a main effect of condition [F(2)= 638.071, p. < .0001] and suffix [F(2)= 108.631, p. < .0001], while it also proved that there is an interaction between the two variables, the condition and the suffix, meaning the significance of the role of each suffix on the difference between the conditions [F(4)= 19.366, p. < .0001].

4.1.4.3. Correlation between suffix and verb type

Beside this, however, further analysis was demanded, because of the wide range of verb categories that were used in the construction of the thematic violations and the novel words. So, there was a need to check the interaction among each verb category and each suffix separately, which was found to be significant [F(20)= 11.310, p. < .0001].

Beginning with suffix –menos, the results per verb category are summarized in Table 2.

Table 2: Suffix –menos per verb category

<table>
<thead>
<tr>
<th>Condition</th>
<th>Verb type</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CatViol</td>
<td>-menos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ThemViol</td>
<td>-menos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novel</td>
<td>-menos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CatViol</td>
<td>-simos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ThemViol</td>
<td>-simos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novel</td>
<td>-simos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CatViol</td>
<td>-tos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ThemViol</td>
<td>-tos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novel</td>
<td>-tos</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For the suffix –menos, which has two meanings, the result and the target meaning, it was found that the difference between the two is statistically significant \[F(4) = 10.066, p.< .0001\], as the formations which mean result had a mean acceptance rate at 0.498 (SD: 0.014), whereas the formations which mean target had a mean acceptance rate at 0.147 (SD: 0.029).

However, what concerns us the most are the subtle differences among verb categories per condition. In Graph 2 are presented the mean acceptability rates of thematic violations of the suffix –menos, where the most accepted verb category proved to be this of the Subject Experiencer Psychological Verbs (Mean: 0.474, SD: 0.028), whose difference from the rest verb categories in this condition seemed to be statistically significant (p. = .000).

Graph 2: Mean acceptance rate for ThemViol -menos

As about the condition of the Novel words, for the suffix –menos the most accepted verb category found to be the one of the transitives (Mean: 0.473, SD: 0.014), which bears a significant difference from the other two (p. = .000). The results of –menos NovW are presented in Graph 3.

Graph 3: Mean acceptance rate for Novel -menos

<table>
<thead>
<tr>
<th>ThemViol</th>
<th>Causative/inchoative</th>
<th>0.239</th>
<th>0.039</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThemViol</td>
<td>Unergative</td>
<td>0.278</td>
<td>0.016</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Inchoative</td>
<td>0.246</td>
<td>0.031</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Psych objexp</td>
<td>0.275</td>
<td>0.033</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Psych subexp</td>
<td>0.474</td>
<td>0.028</td>
</tr>
<tr>
<td>ThemViol</td>
<td>State</td>
<td>0.284</td>
<td>0.017</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Pp obj</td>
<td>0.275</td>
<td>0.067</td>
</tr>
<tr>
<td>Novel</td>
<td>Perception</td>
<td>0.436</td>
<td>0.030</td>
</tr>
<tr>
<td>Novel</td>
<td>Transitive</td>
<td>0.473</td>
<td>0.014</td>
</tr>
<tr>
<td>Novel</td>
<td>Ditransitive</td>
<td>0.193</td>
<td>0.040</td>
</tr>
</tbody>
</table>
Continuing to the suffix –simos, in Table 3 are presented the mean rates of acceptance regarding each verb category.

Table 3: Suffix –simos per verb category

<table>
<thead>
<tr>
<th>Condition</th>
<th>Verb type</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThemViol</td>
<td>Causative/inchoative</td>
<td>0.237</td>
<td>0.015</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Causative</td>
<td>0.538</td>
<td>0.020</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Unergative</td>
<td>0.356</td>
<td>0.016</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Inchoative</td>
<td>0.189</td>
<td>0.027</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Psych objexp</td>
<td>0.432</td>
<td>0.020</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Psych subexp</td>
<td>0.276</td>
<td>0.020</td>
</tr>
<tr>
<td>ThemViol</td>
<td>State</td>
<td>0.175</td>
<td>0.070</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Pp obj</td>
<td>0.378</td>
<td>0.073</td>
</tr>
<tr>
<td>Novel</td>
<td>Perception</td>
<td>0.287</td>
<td>0.035</td>
</tr>
<tr>
<td>Novel</td>
<td>Transitive</td>
<td>0.409</td>
<td>0.011</td>
</tr>
<tr>
<td>Novel</td>
<td>Ditransitive</td>
<td>0.490</td>
<td>0.015</td>
</tr>
</tbody>
</table>

Below, in Graph 3 are presented the mean acceptability rates of thematic violations of the suffix –simos. In this condition, the most accepted verb category found to be this of the causative verbs (Mean: 0.538, SD: 0.020), whose difference from the rest verb categories seemed to be statistically significant (p. < .005).

Graph 4: Mean acceptance rate for ThemViol –simos
Taking into examination the Novel words, for the suffix –simos, being presented in Graph 4, the most accepted verb category proved to be the one of the ditransitives (Mean: 0.490, SD: 0.015), which holds a significant difference from the rest (p. < .005).

Graph 5: Mean acceptance rate for Novel –simos

Finally, the results for suffix –tos regarding each verb type are summarized below in Table 4.

Table 4: Suffix –tos per verb category

<table>
<thead>
<tr>
<th>Condition</th>
<th>Verb type</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThemViol</td>
<td>Causative/inchoative</td>
<td>0.169</td>
<td>0.019</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Unergative</td>
<td>0.239</td>
<td>0.013</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Inchoative</td>
<td>0.085</td>
<td>0.020</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Psych objexp</td>
<td>0.162</td>
<td>0.018</td>
</tr>
<tr>
<td>ThemViol</td>
<td>Psych subexp</td>
<td>0.195</td>
<td>0.023</td>
</tr>
<tr>
<td>ThemViol</td>
<td>State</td>
<td>0.300</td>
<td>0.061</td>
</tr>
<tr>
<td>Novel</td>
<td>Perception</td>
<td>0.266</td>
<td>0.031</td>
</tr>
<tr>
<td>Novel</td>
<td>Transitive</td>
<td>0.323</td>
<td>0.009</td>
</tr>
<tr>
<td>Novel</td>
<td>Ditransitive</td>
<td>0.348</td>
<td>0.025</td>
</tr>
</tbody>
</table>
For the suffix –tos, which has two meanings, the ability and the state meaning, it was found that the difference between the two is statistically significant \( F(4) = 166.491, p.< .0001 \), as the formations which mean ability had a mean acceptance rate at 0.331 (SD: 0.010), whereas the formations which mean state had a mean acceptance rate at 0.223 (SD: 0.014).

In the thematic violations of the suffix –tos, as they are represented below in Graph 5, the verb category of the unergatives has proven to be the most acceptable (Mean: 0.239, SD: 0.013) noting a statistically significant difference only from the inchoatives \( p. = .000 \).

Graph 6: Mean acceptance rate for ThemViol –tos

In terms of the Novel words of the suffix –tos, the results of which are presented in Graph 6, the highest acceptability rate was that of the ditransitive verbs (Mean: 0.348 , SD: 0.025), which is statistically significant though only compared to the category of the Object Experiencer Psychological Verbs \( p. < .005 \).

Graph 7: Mean acceptance rate for Novel –tos
The interaction between the suffix and the verb type found to be crucial, as it was confirmed by the comparison between the two variables that showed a main effect of verb type \( F(12) = 127.366, p. < .0001 \) and suffix \( F(2) = 17.724, p. < .0001 \) revealing an interaction between the two and at the same time indicating the fundamental role of the verb type on the differences per suffix.

4.1.4.4. Categorical violations

Regarding the categorical violations, the formations based on noun roots proved to be more acceptable (Mean: 0.106, SD: 0.008) than those based on adjectival roots (Mean: 0.069, SD: 0.010), with their difference being statistically significant (p. = .013). Moreover, a comparison among the suffix –otos and its phonologically similar suffixes –atos, -otos, -itos, did not reveal any significant difference (p. > .000). The results for the categorical violations are summarized on the Table 5:

Table 5: Mean Acceptance Rate of Categorical violations

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Type</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-menos</td>
<td>Adj</td>
<td>0.077</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>Noun</td>
<td>0.116</td>
<td>0.014</td>
</tr>
<tr>
<td>-simos</td>
<td>Adj</td>
<td>0.087</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>Noun</td>
<td>0.096</td>
<td>0.014</td>
</tr>
<tr>
<td>-tos</td>
<td>Adj</td>
<td>0.043</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>Noun</td>
<td>0.105</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Finally, as about the psycholinguistic variables, none of them proved to affect significantly the acceptability of the pseudowords (p. > .005). Finally, overall analysis revealed that the complexity of the root did not affect the results, as the comparison between the complex and the non complex roots found not to be statistically significant (p. > .005).

4.1.5. Discussion

The primary goal of the current study was to investigate which are the specific argument structure features, that affect the acceptance and the comprehension of the deverbal adjectives with –tos, -menos, -simos and at what extent the lexical items that violate the connection constraints of the above suffixes are accepted with regard to the argument structure (Thematic violation) and the lexical category (Categorical violation).

This interaction was examined with respect to the acceptability of all possible formulations, including lexical items following the grammatical rules (NovW), as well as different kind of violations being subject to constraints, thematic (ThemViol) or categorical (CatViol). In addition, plenty of psycholinguistic factors based on bibliography were taken into account, in order all the elements that influence the comprehension to be checked. To address this issue an on-line grammatical judgment task was carried out.

To begin with, concerning to psycholinguistic variables of number of letters, number of phonemes, number of syllables, phonological and orthographic neighbors,
phonological and orthographic cohort and finally frequency of the root, it seemed that they do not have any remarkable effect on the comprehension of the deverbal adjectives. So, any differentiations among the distinct kind of constructions in the experiment must have been occurred due to the interaction of the syntactic and semantic properties of the root and the suffix, since no significant interaction between the verb type and the condition was detected.

The results of the experiment proved what was shown by previous research (Manouilidou, 2007), that the Novel words are more acceptable than the formations containing some kind of violation. Regarding the two distinct kind of violations, the Thematic violations were found to be more acceptable than the Categorical violations, as it was also expected. This fact suggests that the grammatical category of the stem affects the comprehension, since the categorical constraint has been proved to hold a fundamental role in the participants’ judgment. These findings also revealed an interaction between the suffix and condition, meaning that the suffix’s properties influence the difference among the distinct conditions. This indicates that the attachment restrictions of each suffix and its flexibility to the range of possible combinations defined the acceptance percentage of the three conditions.

4.1.5.1. -simos

Nevertheless, the insertion of a variety of verb categories in the experimental material revealed subtle differences among them and surprising findings. Hence, examining each suffix separately, the results were different. For the suffix –simos, the most acceptable verb category was the one of the causatives, with which were formed thematic violations. This fact is extremely interesting, since lexical items being subject to grammatical constraints were judged as more accepted than those that considered according to grammar to follow the rule. Indeed, words containing thematic violations constructed by causative verbs and the suffix –simos had the highest acceptance rate of 54%, comparing to all the rest types of formations, including also formations of the other two suffixes (-menos, -tos), making the experimental results quite interesting.

Regarding the striking results of –simos, an explanation could be possibly given if we reconsider the claim of Alexiadou (2018) that “verbs that can be attached to a passive morphology but they cannot receive a passive interpretation, as they are not compatible with agentive by-phrases, e.g. skotono ‘kill’ ” they are not compatible with the suffix –simos. Nonetheless, it seems that the verbs of the causative type are capable enough to be combined with this suffix, so their incompatibility with agentive by-phrases might probably does not hold such an influential role in their productivity, since their passive morphology itself allows them to be attached to the suffix –simos.

4.1.5.2. -menos

Similar results arose with the suffix –menos, too. The most acceptable group of its lexical formulations proved to be those constructed with verbs belonging to the category of psychological state’s having the Experiencer in the subject position (PsychSubExp). Again in this case, the combination of the suffix –menos with this category consists a thematic violation, and subsequently, its high acceptance was an
unpredictable result, which it raises much more the concern if it is taken under consideration with the similar effect found in the suffix –simos. In addition, taking into account the –menos suffix and its unexpectedly different interaction with the two subtypes of the psychological verbs, a double question arises: why the PsychSubExp category proved the most accepted and why its difference with the other psychological subtype (PsychObjExp) found statistically significant (p.: < .001). An assumption could be drawn by the suffix’s ambiguous attachment: vP, having a target state by not licensing an agentive by-phrase, or either VP, having a result state by licensing an agentive by-phrase. As it was stated in Neophytou, et al. (2018), this kind of dual capability of the suffix, which is not subject to any morphological rule or thematic constraint, causes a delay in processing and in our case a distinct preference. Supposing that the PsychSubExp verbs have a vP attachment and they cannot license an agentive by-phrase, since in most the cases they do not bear an object, as well, (e.g. *charimenos [ThemViol] apo kapjon, *charika apo kapjon, but also agapimenos apo pollous ‘beloved by many’, agapithike apo pollous ‘was loved by many’), this syntactic property of them is that makes them more acceptable than the PsychObjExp verbs and the rest verb types forming thematic violations with this suffix. However, at this point needs to be mentioned the fact that in NovW with –menos, where the target/result variable was investigated, the result formations found to be far more acceptable than the target ones (p. = .000).

4.1.5.3. –tos

For suffix –tos, though, there is not such a case, for which the most acceptable verb category is the one of the ditransitive verbs, which does not consist a thematic violation, as the above, as it creates novel words. Therefore, plenty of questions arise regarding the underlying reasons of this result. Firstly, regarding the suffix –tos and its differentiation of the other suffixes in terms of thematic violations’ acceptability, it seems that some points can be drawn from Manouilidou (2006). In this research, –menos and other adjectival suffixes including –simos and –tos were under examination, and indeed the results revealed again a deviation concerning suffix –tos and the rest of the suffixes. Thematic roles of the arguments were found to hold a less effective role in the case of this suffix, being compared to the others, which are characterized from high eventive properties unlike -tos, as they were not syntactically licensed. This means that the thematic features of the verb do not have any impact on suffix –tos, and probably this is the reason why it remains stable bearing its nominal properties and not accepting any kind of abnormal combinations. This finding highlights the significance of the eventive character of the deverbal words in their processing. Generally, -tos presents the lowest acceptability rates in all examined combinations, even with novel structures, with the exception of the ditransitives, confirming and reinforcing the above statement about its integrity.

Another issue that has to be highlighted is the dual interpretation of the suffixes –menos and –tos. In the case of –menos suffix, where the result meaning found more acceptable than the target, it is highlighted the significance of the agent factor, since its implication in the syntactic structure of the derived lexical items makes them more accepted. Similarly, for –tos, the ability structures, which are regularly combined with agentive and instrumental prepositional phrases, as well as agent-oriented adverbs,
considered more accepted than those of state supporting again the primary role of the agent in comprehension of deverbal structures. It seems that the presence of the thematic role of the Agent in the argument structure of the verbal stem it is crucial, as it makes derived forms more accepted.

4.2. Experiment 2: Grammatical judgment task of deverbal adjectives by lv-PPA patients

4.2.1. Neurolinguistic Background

In this chapter the mental disorder characterized with the term “primary progressive aphasia” will be described with regard to its subtypes and their distinct features, as well as the performance of the lv-PPA patients in lexical tasks, since the sample of brain-damaged population of the current study consists of the logopenic type of aphasia.

Primary Progressive Aphasia (PPA), as it was first described by Pick and Serieux in 1890s, is a progressive disorder of language caused by atrophy of the frontal and temporal regions of the left hemisphere (Gorno-Tempini et al., 2011). It is characterized by a main language dysfunction for at least the initial stages of the disorder, while other cognitive functions such as memory, behavior and visuospatial abilities deteriorate as the disease progresses influencing: word-finding, object naming, syntax, phonology, morphology, spelling or word comprehension in the context (Mesulam, 1982, 2013). For years the common categorization was between progressive non-fluent aphasia (PNFA/nfa-PPA), which is associated with agrammatism in language production, effortful speech and a deficit in syntactic comprehension, or agrammatic aphasia (PPA-G), a term which appeared in order to refer to cases where grammatical impairments are a prerequisite with or without halting speech (Mesulam et al., 2009; Thompson & Mack, 2014; Thompson et al., 2012), and semantic dementia (SD/PPA-S) or fluent aphasia, which is related to a grammatically correct, but at the same time anomic speech.

Nonetheless, there were some PPA cases impossible to be identified as one of the above PPA types. Thus, Tempini et al (2011) described another type named logopenic aphasia (lvPPA/PPA-L), and having the distinct features of the impaired sentence and phrase repetition and word retrieval in spontaneous speech and naming. Furthermore, logopenic patients are characterized by slow rate speech with frequent pauses caused by word-finding problems, and sound substitutions resulting in phonological paraphasias, in which, nevertheless, articulation and prosody are preserved. The latter feature combined with the lack of frank agrammatism are the key to distinction lv-PPA from PNFA-PPA. Specifically, word retrieval difficulty for nouns found to be greater than that for verbs for lv-PPA patients, whereas verb-argument structure production is also relatively preserved and intransitive and transitive verbs are named with similar accuracy (Mack et al., 2013, Thompson, Cho, et al., 2012, Thompson, Lukic, et al., 2012). Spared single-word comprehension and object knowledge are also possible, while a predominant left posterior perisylvian or parietal atrophy on MRI, or a predominant left posterior perisylvian or parietal hypoperfusion or hypometabolism on SPECT or PET, must be present. According to Thompson & Mack (2014) processing of inflectional morphology (e.g., tense, agreement) is located
in the left inferior frontal gyrus as well as left motor and premotor regions and posterior parietal regions.

Concerning the performance of lv-PPA patients in lexical tasks, studies (Thompson, et al., 2013, Kordouli, et al., 2018) revealed the influence of the grammatical and semantic properties of complex words in their production, as a result of either short-term memory limitations or morphological impairment, which is probably due to an aggravate lemma level. Marshal et al. (1996) report that although PPA patients encounter problems with the core meaning of the words, their processing of the verb’s thematic features remains intact. There are cases, though, according to Marshal (1997) that support the opposite, implying that thematic information and core meaning of the word are independent of one another. Consequently, Marshal places the core features of the verb, which are associated with the meaning, in the concrete domains of the semantic system, whereas the thematic features, id est the argument structure, are resided to the abstract domains. The latter ones are impaired to those patients facing difficulties deal with the verb’s thematic properties.

However, it is worth mentioning the fact that lv-PPA patients showed remarkable accuracy in tasks examining verb inflection and their grammatical performance in general was notably high compared to the other PPA types suggesting a relatively intact syntactic knowledge. The above findings indicate the existence of a morphological impairment in lv-PPA and prove the phonological loop impairment as the cause of deficits in word repetition and sentence comprehension (Auclair-Ouellet, 2015).

In sum, logopenic patients’ performance on lexical tasks revealed a deficit in morphology on contrary to an intact syntactic knowledge resulting by the accurate processing of thematic features. Furthermore, their performance is constantly low compared to the age-matched controls. Nevertheless, in none of the former researches the lv-PPA patients were examined in comprehension of pseudowords, since the tasks included either sentence comprehension or pseudowords’ production. Hence, this study is sought to answer how complex pseudowords, such as deverbal adjectives, which bear the thematic features of the verbal base, are judged by lv-PPA patients. Taking into consideration the above findings, we assume that the lv-PPA patients will not be able to recognize finer grained discriminations and, therefore, their rates of acceptance will be lower than those of the healthy population, whereas their percentage concerning thematic violations will be close enough to that of the controls.

4.2.2. Participants

The participants consisting the brain-damaged population of the study were four (4) patients with the logopenic type of aphasia (lv-PPA) at the age of 53-80 years old.

This kind of patients, belonging mainly to the logopenic type of PPA, were chosen, firstly, because although their syntactic knowledge remains relatively at a good level, their morphology is considerably disturbed (Thompson, et al., 2013, Kordouli, et al., 2018), and considering the fact that the words being under examination in this research are derived by complex morphological processes, we seek to discover how they will be understood by these patients. Secondly, they have performed
satisfactorily enough (Marshal et al., 1996) in processing of thematic information, so it would be interesting to find out how they judge thematic violations.

4.2.3. Materials

Concerning the experimental material for the PPA population, it was selected based on the mean acceptance rates of its lexical item after being judged by the healthy population. Particularly, they were chosen totally ninety (90) lexical items, ten of each combining type in correlation with suffix (-menos, -simos, -tos) and condition (NovW, ThemViol, CatViol). The selected formations, though, were not selected randomly, but according to their means of acceptance, in order to be a gradation of acceptance, from the least accepted to the most accepted ones.

4.2.4. Results

4.2.4.1. Overall results

Regarding the PPA population, who participated in the experiment, the results presented in Table 6 are slightly different comparing to the healthy population.

Table 6: Mean Acceptance Rate per Condition - PPA population

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean PPA</th>
<th>Standard Deviation</th>
<th>Mean Healthy pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thematic Violations</td>
<td>0.427</td>
<td>0.039</td>
<td>0.284</td>
</tr>
<tr>
<td>Categorical Violations</td>
<td>0.267</td>
<td>0.039</td>
<td>0.091</td>
</tr>
<tr>
<td>Novel words</td>
<td>0.540</td>
<td>0.058</td>
<td>0.371</td>
</tr>
</tbody>
</table>

In terms of condition, the PPA patients showed a preference at Novel words with the Thematic violations following, while later are coming the Categorical violations. The comparison between the three kind of formations, however, revealed that there was no significant statistical difference (p. > .005).

4.2.4.2. Correlation between condition and suffix

Inserting the suffix variable in the analysis is necessary, in order to ascertain the correlation among the three suffixes. For categorical violations, formations with the suffix –menos (Mean: 0.340, SD: 0.067), and –simos were equally acceptable (Mean: 0.340, SD: 0.067) and –tos (Mean: 0.120, SD: 0.067) was following. As about thematic violations, formations with the suffix –simos found to be the most accepted of the three (Mean: 0.520, SD: 0.067), then were the formations with –menos (Mean: 0.4, SD: 0.067), and finally the formations with –tos (Mean: 0.360, SD: 0.067). Finally, for novel words, the suffix –menos seemed to be the most acceptable (Mean: 0.530, SD: 0.067), which is followed by –simos (Mean: 0.440, SD: 0.067), and then by –tos (Mean: 0.420, SD: 0.067). However, in none of the three conditions the results are characterized by a significant difference between the formations of the three suffixes (p. > .0001), while no interaction between condition and suffix was found, as well. These results are summarized in the following graph.

Graph 8: Mean acceptance rate in correlation with condition and suffix in PPA population
Regarding the lv-PPA population, although their results were analogous to those of the healthy population: the novel words are more preferable than the violations, whereas the thematic violations were found more accepted than the categorical, their acceptance rates differ. Particularly, an obvious higher percentage of acceptance was observed in all possible combinations, rejecting our initial hypothesis that the PPA population would have lower acceptance rates. This fact is opposed to previous researches (Thompson et al., 2013; Wilson et al., 2014), where the control group had constantly higher performance than the lv-PPA sample in comprehension tasks. Nevertheless, in neither of the two studies the comprehension of pseudowords was examined. Instead, their lexical tasks were assessing either the sentence comprehension, in which they have a core deficit, or the pseudowords’ production. Hence, it could be argued that probably this is due to their impaired morphology (Marshal et al., 1996; Auclair-Ouellet, 2015), which in this case does not allow them to judge so strictly unusual or abnormal combinations. In addition, it also seems that generally the constraints of each suffix, both thematic and categorical, are not applied to the same grade for the lv-PPA patients, as they did for the healthy sample of participants, while particularly the thematic features of the verbal stems do not influence the processing of the deverbal formations to a large extent. This fact is also supported by the fact that there was no interaction found between condition and suffix, as it did for the healthy population, meaning that the suffix’s properties do not affect the differences among the conditions.

What is worth noticing is the fact that in categorical violations the suffixes –menos and –simos have exactly the same acceptance rate of 34%, differentiating them clearly with the suffix –tos. Suffix –tos was judged also by the lv-PPA population to be the least compatible of the suffixes in all the word constructions, supporting its non-transparent character, that was pointed previously. Concerning the under examination thematic violations, –simos proved to be the most accepted suffix to be attached to verbal roots under constraint, whereas in novel words the situation is reversed with –menos being judged as the most compatible. Nonetheless, the insignificant statistical
difference between the three suffixes found in these results does not allow us to draw clear conclusions about the comprehension of such formations by lv-PPA. Possibly, a greater amount of lexical items combined with a larger number of PPA participants would give more accurate results.

5. Conclusion

The aim of the present study was to bring into light the factors that impact on the comprehension of deverbal adjectives in Greek by examining various types of word formations using the suffixes \textit{–simos, –menos, -tos}. 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 lexical factors and syntactic features are more effective and are considered in deverbal processing. In conclusion, the grammatical category of the root, as well as in the case of verbal roots, the kind of verb type including the argument structure properties, play an important role and have a great impact on the deverbal adjectives' comprehension. In addition, the syntactic restrictions of each suffix proved to apply in a greater or a lesser extent for each verb type. Therefore, a gradation concerning the acceptability among the verb categories was revealed with some combinations being more accepted than others.

In sum, the basic findings of this research are:

1) the fact that for the suffixes \textit{–menos and –simos}, formations which were considered as thematic violations were proved to be more accepted than novel words.

2) the interaction found between verb type and suffix, which reveals that the differences found among the suffixes depend on the kind of the root’s verb category providing support for the first finding, too. The fact that, on the one hand, for \textit{–simos} its attachment to causative verbs, and on the other hand, for \textit{–menos} its attachment to PsychSubExp verbs, was a thematic violation, did not affect the participants’ judgment, as it was the kind of the verb type of the root and its syntactic properties that determine the acceptability of the formations. This finding is also supported by the fact that there is no interaction between verb type and condition, meaning the differences among the conditions are independent of the verb category of the stem.

3) the interaction found between condition and suffix. This fact comes to complete the above findings suggesting that the differences among the conditions depend on the kind of the suffix.

4) the fact that suffix \textit{–tos} constantly presents the lowest percentages is translated into its capacity to adhere to its constraints, which determine the types of verbal stems, the suffix can be attached to. This finding reinforces the catalytic role the eventive properties play in the comprehension of deverbal formations.

5) the fact that other linguistic factors, such as root complexity, frequency, etc, had no impact on the comprehension of the deverbal adjectives increases the importance of the argument structure properties on the processing.

Concerning the differences among the verb categories and the unexpected first (1) finding, further research needs to be conducted, in order to understand the underlying
reasons of this result and find which specific features made these combinations accepted.

Although the present study provides considerable evidence regarding the lexical access of deverbal adjectives, as well as insights into how various lexical features interact with adjectival suffixes, the evidence has been collected through a lexical judgment task, where lexical items were given separately. Much more information could be collected from pursuing related scientific research with the same formations being given to sentential context, as well as by seeking out neurological correlates to aspects of lexical processing through electrophysiological, neuroimaging and lesion studies. This kind of research would be particularly interesting for PPA patients too, since the logopenic subtype is characterized by sentence repetition impairment. Thus, given the stimuli in a sentential context, in which lv-PPA individuals have been proved to present a deficit, the comprehension of such complex lexical formations would be extremely demanding for them. These possible future directions for research would enrich the current findings and clearer conclusions could be drawn about mental processing of such derived combinations and their understanding.
<table>
<thead>
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<th>Greek Script</th>
<th>Transliteration</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
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<td>/agapisimos/</td>
<td>‘love-able’,</td>
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<td>λειτουργήσιµος</td>
<td>/liturgisimos/</td>
<td>‘operate-able’,</td>
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</table>
λείψιµος /lipsimos/  ‘miss-able’,
λερώσιµος /lerosimos/  ‘sully-able’,
λυπήσιµος /lipisimos/  ‘sorry-able’,
µακρύσιµος /makrisimos/  ‘elongate-able’,
µαχαιρώσιµος /macherosimos/  ‘stab-able’,
µεγαλώσιµος /megalosimos/  ‘grow-able’,
µελαγχολήσιµος /melanxolisimos/  ‘depress-able’,
µηδενίσιµος /midenisimos/  ‘zero-able’,
µιλήσιµος /milisimos/  ‘talk-able’,
µισήσιµος /misisimos/  ‘hate-able’,
ντροπιάσιµος /dropiasimos/  ‘embarrass-able’,
ζεκινήσιµος /kekinisimos/  ‘begin-able’,
ξοδέψιµος /ksodepsimos/  ‘spend-able’,
παγώσιµος /pagosimos/  ‘frozen-able’,
πείσιµος /pisimos/  ‘persuade-able’,
περάσιµος /perasimos/  ‘pass-able’,
περπατήσιµος /perpatisimos/  ‘walk-able’,
πέσιµος /pesimos/  ‘fall-able’,
πετρώσιµος /petrosimos/  ‘petrify-able’,
πνίξιµος /pniksimos/  ‘choke-able’,
πονέσιµος /ponesimos/  ‘hurt-able’,
σβήσιµος /zvisimos/  ‘erase-able’,
σκορπίσιµος /skorpisimos/  ‘strew-able’,
σκοτώσιµος /skotosimos/  ‘kill-able’,
συγχύσιµος /sinxisimos/  ‘agitate-able’,
συµπαθήσιµος /sibathisimos/  ‘like-able’,
σύρσιµος /sirsimos/  ‘drag-able’,
σφυρίσιµος /sfirisimos/  ‘whistle-able’,
ταξιδέψιµος /taxidepsimos/  ‘travel-able’,
τρέµιµος /tremimos/  ‘shiver-able’,
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τρυπήσιµος /tripisimos/  ‘drill-able’,
χαιρήσιµος /cherisimos/  ‘rejoice-able’,
χαλάσιµος /chalasimos/  ‘ruin-able’,
χειροτερέψιµος /chiroterepsimos/  ‘deteriorate-able’,
χορέψιµος /chorepsimos/  ‘dance-able’,
χοφήσιµος /fovisimos/  ‘fear-able’,
φορτώσιµος /fortosimos/  ‘burden-able’,
φυγόσιµος /figosimos/  ‘leave-able’,
χαρήσιµος /cherisimos/  ‘rejoice-able’,
χαλάσιµος /chalasimos/  ‘ruin-able’,
χειροτερέψιµος /chiroterepsimos/  ‘deteriorate-able’,
χορέψιµος /chorepsimos/  ‘dance-able’,
ψευδόσιµος /psevdosimos/ ‘lie-able’,
ψηλώσιµος /psilosimos/ ‘heighten-able’.

6.1.2. –simos CatViol

Greek script – Transliteration - Translation

Ακρόσιµος /akrosimos/ ‘edge-able’,
αληθήσιµος /alithisimos/ ‘true-able’,
ασπρόσιµος /asprosimos/ ‘white-able’,
βροχίσιµος /vrochisimos/ ‘rain-able’,
γεύσιµος /gefsimos/ ‘taste-able’,
υγιακόσιµος /ginekosimos/ ‘woman-able’,
δεντρόσιµος /dentrosimos/ ‘tree-able’,
διεθνήσιµος /diethnisimos/ ‘international-able’,
δυσκολόσιµος /diskolosimos/ ‘difficult-able’,
εικονάσιµος /ikonasimos/ ‘image-able’,
εξυπνόσιµος /eksipnosimos/ ‘clever-able’,
επικινδυνόσιµος /epikindinosimos/ ‘dangerous-able’,
ευκολόσιµος /efkolosimos/ ‘easy-able’,
ζεστόσιµος /zestosimos/ ‘warm-able’,
ηλιόσιµος /iliosimos/ ‘sun-able’,
καινουριόσιµος /kenurgiosimos/ ‘new-able’,
κακόσιµος /kakosimos/ ‘bad-able’,
κεφαλίσιµος /kefalisimos/ ‘head-able’,
κοιτάσιµος /kutisimos/ ‘box-able’,
λιµνήσιµος /limnisimos/ ‘lake-able’,
παιδίσιµος /pedisimos/ ‘child-able’,
παντελονίσιµος /padelonisimos/ ‘trousers-able’,
φουρνόσιµος /furnosimos/ ‘oven-able’,
πινελόσιµος /pinelosimos/ ‘brush-able’,
προσευχήσιµος /prosefxisimos/ ‘pray-able’,
πληκτρόσιµος /pliktrosimos/ ‘key-able’,
σακουλάσιµος /sakulasimos/ ‘bag-able’,
σκληρόσιµος /sklirosimos/ ‘hard-able’,
σφαιράσιµος /sferasimos/ ‘bullet-able’,
τριχάσιµος /trixasimos/ ‘hair-able’,
τροµερόσιµος /tromerosimos/ ‘terrific-able’,
φοβερόσιµος /foveerosimos/ ‘awesome-able’,
φωρνύσιµος /furnosimos/ ‘oven-able’,
ωραιόσιµος /oreosimos/ ‘pretty-able’.

6.1.3. –simos NovW

Greek script – Transliteration - Translation

<table>
<thead>
<tr>
<th>Greek Script</th>
<th>Transliteration</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Αγγίξιµος</td>
<td>agiksimos</td>
<td>‘touch-able’,</td>
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<td>αγκαλιάσιµος</td>
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<td>morfosimos</td>
<td>‘educate-able’,</td>
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μυρίσιμος /mirisimos/ ‘smell-able’,
ξεχάσιμος /ksexasimos/ ‘forget-able’,
οφειλήσιμος /ofilisimos/ ‘owe-able’,
παρακολουθήσιμος /parakoluthisimos/ ‘watch-able’,
παράξειμος /paraksimos/ ‘product-able’,
παροπλισμός /paroplisimos/ ‘present-able’,
pάρσιμος /parsimos/ ‘take-able’,
pαράξειμος /paraksimos/ ‘pass-able’,
pατήσιμος /patisimos/ ‘step-able’,
pεριγράψιμος /perigrapsimos/ ‘describe-able’,
pοδήξιμος /pidiksimos/ ‘jump-able’,
pασίμος /pasisimos/ ‘step-able’,
pλησιμος /pliroforisimos/ ‘inform-able’,
pισιμοι /pulisimos/ ‘sell-able’,
pροσφέρισµος /prosfersimos/ ‘offer-able’,
pροτιµήσιµος /protimisimos/ ‘prefer-able’,
ράψιµος /rapsimos/ ‘patch-able’,
sηµειώσιµος /simiosimos/ ‘note-able’,
sκεφτίσιµος /sketfisimos/ ‘think-able’,
sτείλσιµος /stilsimos/ ‘send-able’,
sυναντήσιµος /sinadisimos/ ‘meet-able’,
tάσιµος /taisimos/ ‘feed-able’,
tηλεφωνήσιµος /tilefonisimos/ ‘call-able’,
tσιµπήσιµος /tsibisimos/ ‘sting-able’,
φέρσιµος /fersimos/ ‘bring-able’,
φωνάξιµος /fonaksimos/ ‘shout-able’,
χαιρετήσιµος /cheretisimos/ ‘greet-able’,
χαρίσιµος /charisimos/ ‘donate-able’,
χάσιµος /chasimos/ ‘lose-able’,
χτυπήσιµος /chtipsimos/ ‘hit-able’,
χύσιµος /chisimos/ ‘pour-able’,
ψαρεύσιµος /psarefsimos/ ‘fish-able’.
διεφερµένος /diefermenos/ ‘differ-ed’,
εκπληγµένος /ekpligmenos/ ‘surprise-ed’,
εννοηµένος /enoimenos/ ‘mean-ed’,
επιβιώµενος /epibiomenos/ ‘survive-ed’,
ηρεµηµένος /iremimenos/ ‘calm-ed’,
θαυµασµένος /thavmasmenos/ ‘admire-ed’,
θεληµένος /thelimenos/ ‘want-ed’,
θερµασµένος /thermasmenos/ ‘warmen-ed’,
θυµηµένος /thimimenos/ ‘remember-ed’,
κολυµπηµένος /kolibimenos/ ‘swim-ed’,
κριµένος /krimenos/ ‘judge-ed’,
λειτουργηµένος /liturgimenos/ ‘operate-ed’,
λειπόµενος /lipomenos/ ‘miss-ed’,
µακρυµένος /makrimenos/ ‘lenghten-ed’,
µαντευµένος /madevmenos/ ‘guess-ed’,
µελαγχοληµένος /melancholimenos/ ‘depress-ed’,
µισηµένος /misimenos/ ‘hate-ed’,
ντριµένος /trimenos/ ‘run-ed’,
ντυχοµένος /tichomenos/ ‘happen-ed’,
νποθεσµένος /ipothesmenos/ ‘suppose-ed’,
νποφερµένος /ipofermenos/ ‘suffer-ed’,
φανοµένος /fanomenos/ ‘seem-ed’,
φευγµένος /fevgmenos/ ‘leave-ed’,
χαµογελασµένος /chamogelasmenos/ ‘smile-ed’,
χαρηµένος /charimenos/ ‘rejoice-ed’,
χειροτερεµένος /chiroteremenos/ ‘deteriorate-ed’,
χορευµένος /chorevmenos/ ‘dance-ed’,
ψηλωµένος /psilomenos/ ‘heighten-ed’.

6.1.5. –menos CatViol

Greek script – Transiliteration - Translation

Ακροµένος /akromenos/ ‘edge-ed’,
αµαξοµένος /amaksomenos/ ‘car-ed’,
ασπροµένος /aspromenos/ ‘white-ed’,
αστειοµένος /astiomenos/ ‘funny-ed’,
αστεριµένος /asterimenos/ ‘star-ed’,
γλυκοµένος /glikomenos/ ‘sweet-ed’,
γυναικοµένος /ginekomenos/ ‘woman-ed’,
δεντροµένος /dentromenos/ ‘tree-ed’,
διεθνοµένος /diethnomenos/ ‘universal-ed’,
εξυπνοµένος /eksipnomenos/ ‘clever-ed’,
επικινδυνηµένος /epikindinomenos/ ‘dangerous-ed’,
ευχηµένος /efchimenos/ ‘wish-ed’,
ζωγραφιµένος /zografimenos/ ‘picture-ed’,
καθαροµένος /katharomenos/ ‘clean-ed’,
κακοµένος /kakomenos/ ‘bad-ed’,
καλοµένος /kalomenos/ ‘good-ed’,
κεφαλοµένος /kefalomenos/ ‘head-ed’,
κουβερτοµένος /kuvertomenos/ ‘blanket-ed’,
λιµνηµένος /limnimenos/ ‘lake-ed’,
µικροµένος /mikromenos/ ‘small-ed’,
µπαλονιµένος /balonimenos/ ‘balloon-ed’,
οµορφοµένος /omorfomenos/ ‘beautiful-ed’,
ορασµένος /orasmenos/ ‘vision-ed’,
παιδιµένος /pedimenos/ ‘child-ed’,
παιχνιδιµένος /pechnidimenos/ ‘toy-ed’,
παντελονισµένος /padelonismenos/ ‘trousers-ed’,
πινελοµένος /pinelomenos/ ‘brush-ed’,
σακουλοµένος /sakulomenos/ ‘bag-ed’,
σκληροµένος /skliromenos/ ‘hard-ed’,
σκυλοµένος /skilomenos/ ‘dog-ed’,
στοµοµένος /stomomenos/ ‘mouth-ed’,
σφαιροµένος /sferomenos/ ‘bullet-ed’,
τριχαµένος /trichamenos/ ‘hair-ed’,
φουσταµένος /fustamenos/ ‘skirt-ed’,
χαποµένος /chapomenos/ ‘pill-ed’,
χαρτοµένος /chartomenos/ ‘paper-ed’,
ψευτικοµένος /pseftikomenos/ ‘fake-ed’,
ωραιοµένος /oreomenos/ ‘pretty-ed’.

6.1.6. –menos NovW

Greek script – Transiliteration - Translation

Ακουσµένος /akusmenos/ ‘listen-ed’,
ακυροµένος /akiromenos/ ‘cancel-ed’,
ανακαλυµµένος /anakalimenos/ ‘discover-ed’,
αφαιροµένος /aferomenos/ ‘remove-ed’,
βλεµµένος /vlemenos/ ‘see-ed’,
βοηθηµένος /voithimenos/ ‘help-ed’,
βρισκοµένος /vriskomenos/ ‘find-ed’,
βρισµένος       /vrismenos/       ‘curse-ed’,
γευµένος         /gevmenos/         ‘taste-ed’,
δαγκωµένος    /dagomenos/         ‘bite-ed’,
δειχµένος        /dichmenos/       ‘show-ed’,
διακριµένος     /diakrimenos/       ‘discern-ed’,
διαφωνηµένος /diafonimenos/ ‘disagree-ed’,
διηγηµένος      /diigimenos/ ‘narrate-ed’,
κοιταγµένος     /kitagmenos/       ‘look-ed’,
µυρισµένος      /mirismenos/       ‘smell-ed’,
παραµένοντας      /paramenontas/       ‘stay-ed’,
παραγµένος      /paragmenos/       ‘product-ed’,
παρακολουθηµένος /parakolouthimenos/ ‘watch-ed’,
παραλαβοµένος /paralavomenos/ ‘receive-ed’,
παρασχεµένος /paraschemenos/ ‘commit-ed’,
περιγραµµένος   /perigramenos/       ‘describe-ed’,
περικλεισµένος  /periklismenos/       ‘enclose-ed’,
περιµενοµένος    /perimenomenos/       ‘wait-ed’,
πληροφορηµένος /pliroforimenos/ ‘inform-ed’,
συναντηµένος     /sinadimenos/       ‘meet-ed’,
σωσµένος           /sosmenos/       ‘save-ed’,
τηλεφωνηµένος  /tilefonimenos/       ‘call-ed’,
θανατοφάσµενος /thanasafasmeno/ ‘die-ed’,
θυµωτός /thimotos/ ‘angry-able’,
kολυµητός /kolibitos/ ‘swim-able’,
kρωτός /kriotos/ ‘cool-able’,
λειτουργητός /liturgitos/ ‘operate-able’,
λειετός /lipitos/ ‘miss-able’,
λειροτός /lerotos/ ‘sully-able’,
λυπητός /lipitos/ ‘sorry-able’,
µακρυτός /makritos/ ‘lengthen-able’,
µεγαλωτός /megalotos/ ‘grow-able’,
µελαγχολητός /melancholitos/ ‘depress-able’,
µιλητός /militos/ ‘speak-able’,
ξεκινητός /ksekinitos/ ‘begin-able’,
ξυπνητός /ksipnitos/ ‘wake-able’,
παγωτός /pagotos/ ‘frozen-able’,
περστός /perastos/ ‘pass-able’,
περιπλανητός /periplanitos/ ‘wonder-able’,
περπατητός /perpatitos/ ‘walk-able’,
περπατητός /perpatitos/ ‘pass-able’,
πεστός /pestos/ ‘fall-able’,
πικραιτός /pikretos/ ‘embitter-able’,
πονητός /ponitos/ ‘hurt-able’,
στενευτός /steneftos/ ‘narrow-able’,
σφυριστός /sfiristos/ ‘whistle-able’,
ταξιδευτός /taksideftos/ ‘travel-able’,
τελειωτός /teljotos/ ‘finish-able’,
τρεµητός /tremitos/ ‘shiver-able’,
τρεχτός /trechtos/ ‘run-able’,
τροµαστός /tromastos/ ‘scare-able’,
φευκτός /fefktos/ ‘leave-able’,
φοβητός /fovitos/ ‘frighten-able’,
φταρνιστός /ftarnistos/ ‘sneeze-able’,
χαλαστός /chalastos/ ‘ruin-able’,
χειροτερευτός /chirotereftos/ ‘deteriorate-able’,
χορευτός /choreftos/ ‘dance-able’,
ψευδιστός /psevdistos/ ‘lisp-able’,
ψευδοτός /psevdotos/ ‘lie-able’,
ψηλωτός /psilotos/ ‘heighten-able’.

6.1.8. –tos CatViol

**Greek script – Transiliteration - Translation**

Αγκαλιατός /agaljatos/ ‘hug-able’,
ακρητός /akritos/ ‘edge-able’,
αληθητός /alithitos/ ‘true-able’,
αρκουδατός /arkudatos/ ‘bear-able’,
ασπροτός /asprotos/ ‘white-able’,
αυγοτός /avgotos/ ‘egg-able’,
αυστηρότός /afstirotos/ ‘strict-able’,
βιβλιοτός /vivliotos/ ‘book-able’,
δάκρυτός /dakritos/ ‘tear-able’,
δεντροτός /dentrotos/ ‘tree-able’,
διεθνητός /diethnitos/ ‘universal-able’,
δυσκολοτός /diskolotos/ ‘difficult-able’,
δωροτός /dorotos/ ‘gift-able’,
eθνικοτός /ethnikotos/ ‘national-able’,
eξυπνοτός /eksipnotos/ ‘clever-able’,
eπικινδυνητός /epikindinitos/ ‘dangerous-able’,
eυκολοτός /efkolotos/ ‘easy-able’,
eυχητός /efchitos/ ‘wish-able’,
ζεστοτός /zestotos/ ‘warm-able’,
καθαροτός /katharotos/ ‘clean-able’,
κειµενοτός /kimenotos/ ‘text-able’,
κεφαλιτός /kefalitos/ ‘head-able’,
κειµενοτός /kimenotos/ ‘text-able’,
κειµενοτός /kimenotos/ ‘text-able’,
κουρασητός /kurasitos/ ‘tiredness-able’,
λιµνητός /limnitos/ ‘lake-able’,
λυπητός /lipitos/ ‘sadness-able’,
µεγαλοτός /megalotos/ ‘big-able’,
µικροτός /mikrotos/ ‘small-able’,
µπαλονιτός /balonitos/ ‘balloon-able’,
µπρατσοτός /bratsotos/ ‘arm-able’,
µαλακότος /malakotos/ ‘soft-able’,
παιδικοτός /pedikotos/ ‘childish-able’,
παιδιτός /peditos/ ‘child-able’,
παντελονιτός /padelonitos/ ‘trousers-able’,
πινελοτός /pinelotos/ ‘brush-able’,
προσευχητός /prosefchitos/ ‘pray-able’,
σακουλατός /sakulatos/ ‘bag-able’,
σκουλαρικιτός /skularikitos/ ‘earring-able’,
στενοτός /stenotos/ ‘narrow-able’,
στοµατός /stomatos/ ‘mouth-able’,
τηλεφωνοτός /tilefonotos/ ‘phone-able’,
τριχατός /trichatos/ ‘hair-able’,
τροµεροτός /tromerotos/ ‘terrific-able’,
φουστατός /fustatos/ ‘skirt-able’,
ψηλοτός /psilotos/ ‘tall-able’,
ψευτικοτός /pseftikotos/ ‘fake-able’,
χαπιτός /chapitos/ ‘pill-able’,
χωριοτός /chorjotos/ ‘village-able’,
ψευτικοτός /pseftikotos/ ‘fake-able’,
ψηλοτός /psilotos/ ‘tall-able’. 
6.1.9. –tos NovW

**Greek script – Transliteration - Translation**

- Αγγιστός /agistos/ ‘touch-able’
- αγκαλιαστός /agaljastos/ ‘hug-able’
- αγχωτός /anchotos/ ‘stress-able’
- αηδιαστός /aidiastos/ ‘disgust-able’
- ακυρωτός /akirotos/ ‘cancel-able’
- αλειφτός /aliftos/ ‘anoint-able’
- ανάβλητός /anavlitos/ ‘postpone-able’
- ανακαλυπτός /anakaliptos/ ‘discover-able’
- ανησυχητός /anisichitos/ ‘worry-able’
- αντιγραφτός /adigraftos/ ‘copy-able’
- απογοητευτός /apogoiteftos/ ‘disappoint-able’
- αποφασιστός /apofasistos/ ‘decide-able’
- αριθµιστός /arithmistos/ ‘number-able’
- βιωτός /viotos/ ‘experience-able’
- βλεφτός /vleftos/ ‘see-able’
- βοηθητός /voithitos/ ‘help-able’
- βρισκοτός /vriskotos/ ‘find-able’
- βριστός /vristos/ ‘curse-able’
- γευτός /geftos/ ‘taste-able’
- δηλωτός /dilotos/ ‘state-able’
- διαβαστός /djavastos/ ‘read-able’
- διηγητός /diigitos/ ‘narrate-able’
- διορθωτός /diorthotos/ ‘fix-able’
- δουλευτός /duleftos/ ‘work-able’
- δωριστός /doristos/ ‘donate-able’
- εγκαταλειπτός /egataliptos/ ‘abandon-able’
- εγκλωβιστός /eglovistos/ ‘trap-able’
- εκπληκτός /ekpliktos/ ‘surprise-able’
- εμποδιστός /ebodistos/ ‘block-able’
- εμφανιστός /emfanistos/ ‘appear-able’
- ενθουσιαστός /enthusiastos/ ‘exite-able’
- ενοχλητός /enochlitos/ ‘annoy-able’
- εξηγητός /eksigitos/ ‘explain-able’
- επηρεαστός /epireastos/ ‘influence-able’
- ηρεµηστός /iremistos/ ‘calm-able’
- θεριστός /theristos/ ‘harvest-able’
- θυµητός /thimitos/ ‘remember-able’
- καθαριστός /katharistos/ ‘clean-able’
- καλυπτός /kaliptos/ ‘cover-able’
- κερδιστός /kerdistos/ ‘win-able’
- κλεφτός /kleftos/ ‘steal-able’
- κλητός /klitos/ ‘call-able’
κοιταχτός /kitachtos/ ‘look-able’,
kουνητός /kunitos/ ‘shake-able’,
kουφετός /kureftos/ ‘crop-able’,
kρυφτός /kriftos/ ‘hide-able’,
kυκλωτός /kiklotos/ ‘circle-able’,
μαστής /masitos/ ‘chew-able’,
μεταφερτός /metafertos/ ‘transfer-able’,
μορφωτός /morftos/ ‘educate-able’,
μυριστός /miristos/ ‘smell-able’,
ντροπιαστός /dropjastos/ ‘embarrass-able’,
ξεχαστός /ksechastos/ ‘forget-able’,
παραγτός /paragtos/ ‘produce-able’,
παρακολουθητός /parakoluthitos/ ‘watch-able’,
παρατηρητός /paratiritos/ ‘observe-able’,
πειραχτός /pirachtos/ ‘bother-able’,
περιγραπτός /perigraptos/ ‘describe-able’,
πηδηχτός /pidichtos/ ‘jump-able’,
πιαστός /pjastos/ ‘catch-able’,
προτιµητός /protimitos/ ‘prefer-able’,
ραπτός /raptos/ ‘patch-able’,
σηµειωτός /simiotos/ ‘note-able’,
σκεφτός /skeftos/ ‘think-able’,
συγχυστός /sinchistos/ ‘frustrate-able’,
συζητητός /sizititos/ ‘discuss-able’,
τιµητός /timitos/ ‘honor-able’,
τσιµπητός /tsibitos/ ‘sting-able’,
φαγωτός /fagotos/ ‘eat-able’,
φερτός /fertos/ ‘bring-able’,
φιλητός /filitos/ ‘kiss-able’,
χαιρετητός /cheretitos/ ‘greet-able’,
χαριστός /charistos/ ‘donate-able’,
χαστός /chastos/ ‘lose-able’,
ψαρευτός /psareftos/ ‘fish-able’.
7. References


