Genitive non-head nouns in L2 English compounds: The effect of L1 formal properties

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Abstract
This is a cross-sectional study on the acquisition of English compounds, e.g. ‘a bell designer’ and ‘truck industry’, by Greek adults. Despite the structural similarity between the L1 and the L2 forms, due to a difference they have at PF it was hypothesized that learners misanalyse the L2 items as complex DP phrases and that, consequently, the interlanguage forms would exhibit the effect of L1 formal properties involved in phrasal noun combination. As a result, the learners would differ from the natives concerning the possibility of genitive non-head noun in compounds, e.g. ‘a bell’s designer’ and ‘trucks’ industries’. The participants were 30 intermediate and 30 advanced learners, as well as 20 English natives. The empirical data, elicited through picture-naming, grammaticality judgements and referentiality judgements, seem to verify our hypothesis. Moreover, they indicate that while the interlanguage compound structure is UG-constrained, parameter resetting of formal properties may not be possible in adult language acquisition.

Keywords: endocentric noun-noun compounds, root/deverbal, genitive non-head, covert P(reposition), strong/weak D(eterminer) feature, interlanguage representation

1. Introduction
The present paper investigates the possibility of the ’s /’ genitive affix inside L2 English endocentric noun-noun compounds (NNCs) acquired by L1 Greek adults. Specifically, the NNCs dealt with are: (a) root compounds, in which the
head noun (HN) is an underived nominal and whose members are in an adjunct-head relation, e.g. 'pea soup', and (b) -er deverbal compounds whose internal argument is satisfied by the non-head noun (NHN) (for instance, Spencer 1991: 324-326), e.g. 'tomato grower'.

In English, NNCs are right-headed and generally disallow inflectional affixes inside them. The number and the genitive case of the compound is marked on its HN:

(1a) tomato salads cf. *tomatoes salad
(1b) a taxi driver's job cf. *a taxi's driver job

In line with Bauer (1983: 38) and Pinker (1999: 180), I consider the canonical form of the NHN in English compounds a stem (or a root), not a word (but cf. Selkirk 1982: 53). Moreover, assuming that (a) bar-projection rules can be extended so that X0 may dominate two (other) X0 node heads, be they below the word level, (cf. Fabb 1984 reported by Lardiere 1994) and (b) that a noun in an argument position is a DP (Longobardi 1994: 628), a NNC is a single DP and has the structure demonstrated below, simplified for the present purposes.

(2)

\[
\text{DP} \quad \begin{array}{c}
\text{D} \\
\text{a/the/O} \\
\text{NP} \\
\text{N} \\
\text{tomato} \quad \text{N} \\
\text{grower(s)}
\end{array}
\]

As regards endocentric root and deverbal NNCs in Modern Greek (MG), the prevalent type is highly productive one-word items which are canonically right-headed. Their NHN is a stem (or a root) and when the HN starts with a consonant, the constituent parts are linked with the vowel -o-. Examples are shown in (3a,b) with hyphens added to illustrate the morphological makeup of these NNCs.

(3a) μπιζέλ-ό-σουπα < μπιζέλ (pea) + σούπα (soup)
'pea soup'

(3b) ντοματ-ο-παραγωγός < ντομάτα (tomato) + παραγωγός (grower)
'tomato grower'

In MG there are also left-headed phrasal NNCs of two types, in one of which the NHN is marked with the genitive case, e.g. 'ένα κουτόλι (ης) σούπας' (a spoon (the-gen) soup-gen, 'a soup spoon'). According to Nespor and Ralli
(1996: 366), these NNCs are generated in syntax and "subsequently reanalysed as X0 when they enter the lexicon". Because, as I intend to show, the interlanguage forms constitute complex DP constructions, phrasal compounds will not concern us here. This said, I consider English and MG one-word NNCs morphological items with a similar structure (cf. Di Sciullo and Ralli 1994: 61-68, 72-75, Di Sciullo and Ralli 1999: 185-189, Agathopoulou 2003).

Consequently, in terms of L1 effect, Greek learners of English should not encounter problems in the acquisition of the discussed L2 forms. However, because unlike in MG, in English there is no morphophonological difference between a (regular) singular noun and its stem, the learners may perceive the NHN in an English NNC as an autonomous word and, by extension, as a DP. Hence, the interlanguage compounds may be affected by L1/L2 parametric differences involved in syntactic noun combination dealt with next.

2. Syntactic noun combination: English vs. M. Greek

In English syntactic expressions, a noun can modify another noun as the complement of a P(reposition):

(4a) a soup of peas
(4b) a producer of tomatoes

Note that 'peas' and 'tomatoes' in (4a,b) are similar to 'pea' and 'tomato' in the NNCs (see the translations in (3a,b)) in that they are generic, that is, they refer to a whole class of items. However, while the latter are N0s, the plural bare nominals are DPs headed by a null D(eterminer) (Longobardi 1994: 621, Radford 1997: 151-154) with a [-specific] feature (Bongartz 2002: 23).

Regarding MG, when the head DP is a root nominal, a complex DP structure containing a preposition may alternate with an A(dnominal) G(enitive) structure (5a). This is not acceptable in English (5b).

(5a) μια βιομηχανία για αυτοκίνητα / μια βιομηχανία αυτοκινήτων
an industry for cars-acc / an industry cars-gen
'the industry for/of cars'

(5b) "a cars' industry

As well known, in English, when the non-head DP is [-animate] a DP+PP+DP construction or a NNC is the preferred option, the AG being acceptable only given certain qualifications (see, for instance, Quirk et al. 1985: 324). This is a complicated area and will not be dealt with here. The point is that while in English the discussed alternation is limited by extra-grammatical factors, as for instance, the extent to which the speaker feels that the NHN is
“of special interest to human activity” (Quirk and Greenbaum 1977: 97), in MG there are no such limitations to an AG. According to Horrocks and Stavrou (1987: 104), this happens because, unlike in English, in MG a noun can be assigned the genitive case by another noun which properly governs it.

To turn to an approach within Chomsky’s (1995) minimalist theory, Bouba (2000) deals with double object constructions in MG, in which the indirect object (IO) may occur either as the complement of a P or in the genitive. Extending a suggestion by Salles (1997), Bouba proposes that these constructions can be analyzed in a unified manner, if we assume that a functional P(reposition) is always present, but it is overt only when the IO is in the accusative. When the IO is marked with a genitive in MG, the specific case is the mophophonological reflex of a covert P with a strong D, symbolized as D* (cf. Roberts and Roussou’s 1999 theory). More specifically, P(D*) attracts the D of its complement DP, creating a [P+D] complex which “affects the pronunciation of the IO. PF rules will interpret the abstract [P+D] complex as a single phonological word inflected for gen. case” (Bouba ibid.). In English P does not have a strong D, hence the IO cannot be in the genitive case. Bouba (1998: 58-60) supports this analysis by pointing out that unlike in English, in MG prepositions have an affixal character (e.g. jia aftin → ji’ aftin ‘for her’, jia ti → jia ti [lit. for what] ‘why’). As she shows (ibid.), this is further attested by the fact that while P-pied-piping is possible in both languages dealt with here, P-stranding is possible only in English.

I suggest that the above proposal may be extended to account for the possibility of the alternation between a DP+PP+DP and an AG structure. Importantly, one of Bouba’s conditions for this alternation which concerns us is that the D of the non-head DP must be lexicalized. I assume that this condition is met, since the D is potentially overt in MG (6a). On the other hand, in English it is not (6b).

(6a) η βιομηχανία για τ’ αυτοκίνητα / η βιομηχανία των αυτοκινήτων
the industry for (the-acc) cars-acc / the industry the-gen cars-gen
(6b) the industry for (*the) cars

This cross-linguistic difference is due to that only in MG may the definite article be used expletively, that is, without semantic content (Roussou and Tsimpli 1994: 74-75), so it does not affect the [-specific] feature of the NHN. In English, the definite article is unacceptable in the respective position in that it attributes a [+specific] feature to its complement DP.

Nevertheless, the discussed alternation does not occur in partitive constructions:
(7) ΄Εναι μπουκάλι με νερό / ΄Εναι μπουκάλι νερό
A-nom bottle-nom with water-acc / a-nom bottle-nom water-acc
ˈA bottle with water / a bottle of water

Therefore I propose that in complex DP phrases in MG a [+generic, -specific] non-head DP occurs in the genitive due to the morpho(phono)logical reflex of a fusion between an abstract \( P \) and the \( D \) of its complement DP, triggered by the \( D^* \) of \( P \), under the condition that the complex DP is not a partitive construction. The suggested structure within PP is demonstrated in (8).

(8) (η βιομηχανία των αυτοκινήτων)

When the NHN is in the accusative, the \( P \) is overt both in the English and in the MG respective constructions. On the other hand, when the head DP is a deverbal nominal, the AG is the only option in MG:

(9) οδηγοί φορτηγών / *οδηγοί από φορτηγά
drivers trucks-gen / drivers of trucks

I suggest that this is due to that deverbal nominals have different properties than those of root nominals. The non-head DP in the former is the internal argument of the head DP, while in the latter it is an adjunct. Also, while nominals inherit the direct argument constancy of the verb they derive from, they don’t have its case-assigning properties. Cross-linguistically, verbs theta-mark their (direct) internal arguments by assigning them the accusative case. The parametric variation between the two languages under examination is that deverbal nominals in English cannot assign case to their complement nouns and this is done through a preposition; in MG, deverbal nouns directly assign case to their complement nouns but, unlike verbs, those assign the genitive case.

Regarding the AG structure in MG, it has been suggested that the non-head DP is base-generated post-nominally and, when it appears before the DP it modifies, it is in a non-argument (\( A' \)) position, at specifier, DP, which is parallel to the spec, CP (Alexiadou and Stavrou 1999: 37-38). This is shown next
(adapted from Marinis 2003: 62).

(10a) (Βοήθασα) το βιβλίο του Γιάννη
(found-I) the-acc book-acc the-gen John-gen

(10b) (Βοήθασα) του Γιάννη το βιβλίο
(found-I) the-gen John-gen the-acc book-acc
‘(I found) John’s book’

Importantly, due to the strong (i.e. morphologically marked) agreement in case (as well as in number and gender) between determiners, adjectives and nouns in Greek, an additional functional projection (FP) between D and its complement noun has been postulated for the DP architecture in this language to host the above agreement features (see, among others, Alexiadou, Haege- man and Stavrou 2001: 28). On the other hand, in English, no such FP is justified due to lack of the respective agreement features. In (10a,b) the extra projection is omitted because of space constraints. I return to this point in the discussion of the interlanguage data.

Before laying out the hypotheses concerning the experimental study, let me point out a difference between NNCs and syntactic noun combination, which is crucial in this study. Consider (11a,b) from Sproat (1988: 291) and (12) from Bongartz (2002: 31).

(11a) Drivers of trucks fill them up with diesel.
(11b) *Truck drivers fill them up with diesel
(12) The new president’s car is faster than the old one’s was.

A pronoun may refer to the non-head nominal in (11a) and in (12) but not in (11b), where this is part of a NNC. According to Sproat (ibid.), this occurs because only maximal projections can serve as antecedents of pronominals; compounds are words consisting of ‘submaximal projections’, hence the unacceptability of (11b). In view of the above, Bongartz (2000: 181) suggests that investigating learner intuitions about the possibility of referring separately to
the NHN in compounds might throw more light into the underlying representation of the interlanguage compound structure. This suggestion has been followed here, as it will be discussed later.

Assuming that (positive or negative) L1 transfer occurs in adult language learning, the hypotheses concerning the experimental results were as follows:

(1) Because of the structural similarity of NNCs in the L1 and the L2, the learners will not differ significantly from the natives as to
   (i) production/rejection of NNCs with genitive NHN
   (ii) the possibility of referring separately to the NHN in a NNC.

(2) Due to the morphophonological identification between a word and its stem in English, the learners may perceive the NHN in NNCs as a word and, by extension, as a DP. In this case, they will differ significantly from the natives as to (i) and (ii) above due to L1 effects concerning syntactic noun combination, namely, (a) the P(D*), and (b) the case-assigning property of deverbal nominals.

3. The study

3.1 Method

The participants were 30 intermediate and 30 advanced Greek learners (mean age: 18.5) classified according to their scores in the Oxford Placement Test (OPT) (Allan 1992: 89), and 20 L1 English controls (mean age: 38). The tasks, done on an individual basis, targeted at novel, or non-usualized / non-lexicalized NNCs and were as follows.

(a) Picture-naming task (PNT)

This purported at checking also for regular/irregular plural NHN, as well as word order and consisted of 37 pictures, each showing two sets of items. Nine of the pictures targeted what could be interpreted as genitive /s/ inside a compound and each one of them included two single cues; their combination was expected to yield [-animate] root NNCs. Those were ‘apple worm’, ‘church key’, ‘face towel’, ‘chair cushion’, ‘onion bread’, ‘desert rain’, ‘sea wind’, ‘hat ribbon’ and ‘nose ring’ (see Appendix I for examples). Before they started, participants had practice with pictures in which either the cue for the NHN was a mass noun, or the cue for the HN corresponded to a word starting with /s/, as in ‘wine drinkers’ and ‘strawberry shirt’, respectively. Moreover, there was a list of the required vocabulary items with their Greek translations, which the
participants were allowed to look up. All answers were taped and at the same time transcribed by the investigator.

(b) Grammaticality judgement task (GJT)

This was a paced task comprising seventy-two sentences randomly ordered and controlled for length (see Appendix II). The participants read and simultaneously listened to each sentence taped by a native speaker and had to judge them on a five-point scale from \(-2\) (definitely incorrect) to \(+2\) (definitely correct), with 0 standing for ‘I don’t know’ (see Tsimpli 2003: 220, among others). 36 sentences contained compounds, 6 with genitive NHN (‘ungrammatical’) and 6 with unsuffixed NHN (‘grammatical’). Those were further subdivided so that there was an equal number of root and deverbal compounds. Each of the ungrammatical sentences was identical to the respective grammatical one in terms of syntactic structure but included some different words. The rest of the sentences aimed at investigating the possibility of regular/irregular plural NHN or were distractors. Last, the results from another test had ensured that the participants had no problems with the graphic differentiation between the plural and the genitive affix. The items used for the investigation of genitive NHN are shown in Table 1.

<table>
<thead>
<tr>
<th>UNGRAMMATICAL</th>
<th>GRAMMATICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our friends are dolls’ importers</td>
<td>Our visitors are desk manufacturers</td>
</tr>
<tr>
<td>My sister is a bell’s designer</td>
<td>My mother is a computer operator</td>
</tr>
<tr>
<td>Her parents have a hat’s company</td>
<td>Her uncle has a car business</td>
</tr>
<tr>
<td>This place is the toys’ museum</td>
<td>This building is the chair factory</td>
</tr>
<tr>
<td>The cigars’ maker over there is from Cuba</td>
<td>The dog owner over there is from France</td>
</tr>
<tr>
<td>There are many trucks’ industries in Chicago</td>
<td>There are many bicycle shops in Holland</td>
</tr>
</tbody>
</table>

(c) Referentiality judgement task (RJT)

The RJT consisted of 12 pairs of sentences, 6 used as controls and 6 not involving a NNC/DP+PP+DP contrast. An example from each category is shown next.

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1 Many thanks are due to Ed Joycey for his invaluable help in the final version of this task.
In which of the following sentences is 'it' more likely to refer only to 'cigar'?  
(a) The smoker of the cigar said it was made in Spain.  
(b) The cigar smoker said it was made in Spain.  
A. In sentence (a)  B. In sentence (b)  C. No difference

In which of the following sentences is 'them' more likely to refer only to 'parents'?
(a) When he met the children with their parents, he congratulated them.  
(b) When he met the children's parents, he congratulated them.  
A. In sentence (a)  B. In sentence (b)  C. No difference

Answers in all tasks were coded as 1 for right and 0 for wrong. In the GJT minus and plus answers were collapsed and the 'I don't know' ones were excluded. Also, one of the control sentences in the RJT did not count in the statistical analysis because there were two possibly correct answers to it. Given that the distribution was normal, the statistical tool used was one-way and multiple measures ANOVAs for between-group and within-group differences respectively, followed by post-hoc Bonferroni tests.

3.2 Results

In the PNT the advanced learners (ADV) performed like the native speakers (NS) with a successful percentage of 100, while the intermediate group (INT) were successful at 94.05% (253/269). However, both the NS-INT and the ADV-INT difference proved to be statistically significant at p<0.05. Let us now turn to results in Table 2.

<table>
<thead>
<tr>
<th>LEVELS</th>
<th>UNGRAMMATICAL</th>
<th>GRAMMATICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROOT DEVERBAL</td>
<td>ROOT DEVERBAL</td>
</tr>
<tr>
<td>NS(20)</td>
<td>93.22 (55/59)</td>
<td>100(60/60)</td>
</tr>
<tr>
<td>ADV(30)</td>
<td>75.30 (61/81)</td>
<td>94.12(80/85)</td>
</tr>
<tr>
<td>INT(30)</td>
<td>40.23 (35/87)</td>
<td>77.64(66/85)</td>
</tr>
</tbody>
</table>

In judgements on compounds with genitive NHN, the between-group difference was significant both for the root and for the deverbal category (F(2,65)=17.470; p<0.001) and (F(2,61)=17.273; p<0.000) respectively. The post-hoc test revealed that the NS-INT and the ADV-INT difference was significant (p<0.001) with respect to both compound categories. On the other hand, the NS-ADV difference was significant (p<0.05) only regarding deverbal com-
pounds and the root/deverbal within-group difference for the ADV was at a very near-significant level ($p=0.057$).

The between-group difference was significant also regarding judgements on the grammatical items ($F(2,69)=9.292; p<0.001$), due solely to the performance of the INT who differed from both the NS and the ADV at $p<0.01$. Moreover, this group fared significantly better in grammatical deverbal than in grammatical root NNCs, for which I cannot provide an explanation. Now consider the results in Table 3.

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>TEST ITEMS</th>
<th>CONTROL ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>81.66 (98/120)</td>
<td>91.00 (91/100)</td>
</tr>
<tr>
<td>ADV</td>
<td>61.11 (110/180)</td>
<td>90.00 (115/150)</td>
</tr>
<tr>
<td>INT</td>
<td>50.55 (91/180)</td>
<td>88.00 (132/150)</td>
</tr>
</tbody>
</table>

The statistical analysis revealed a significant between-group difference in total results ($F(2,77)=7.805; p=0.001$). According to the post-hoc test, both learner groups differed significantly from the NS but not from each other (NS-ADV: $p=0.033$, NS-INT: $p=0.001$, ADV-INT: $p=0.417$). On the other hand, there was no between-group difference with respect to the control items. Aside from this, there were effects in terms of level of proficiency, type of task and compound category.

Last, let it be stressed that although in the GJT the learners accepted also regular plural NHNs to a large extent, these results exhibited a pattern importantly different from that of results regarding genitive NHNs. Hence, it is safe to assume that acceptance of a genitive NHN was not affected by whether this was also in the plural.

4. Discussion and conclusion

Hypothesis A was clearly disconfirmed. To consider the extent to which Hypothesis B was upheld, let me first discuss the discrepancy manifested in the performance of the participants between the PNT and the GJT. This is not uncommon in L2 acquisition studies involving the investigation of a structure through both a production task and a GJT (see Bongartz 2002: 116-127, among others). Could it be an artifact of the task design? I think not. Note that also the NS fared worse in the GJT than in the PNT. Mutatis mutandis, the difference between the NS and the learners should not be significant, if the interlanguage
compounds had a target-like representation without the L1 effects of the sort discussed, and it seems that a paced task calling for judgements is a better method to reveal such effects. Further support for this position comes from the results of the RJT. In my opinion, lack of significant between-group difference concerning referentiality judgements in the control items indicates that the participants’ linguistic sophistication in this domain was about equal in all groups. Therefore, the difference between the NS and the learners with respect to the test items, combined with results from the GJT allows the assumption that the L2 compounds have a non-target like representation, namely that of a complex DP structure.

As for the effect of compound category, recall that in the GJT the NS-ADV difference was significant only regarding the deverbal items. Can it then be surmised that, on the one hand, the ADV have reset the value of the D feature of P from the L1 strong to the L2 weak specification but, on the other hand, they have not yet acquired the L2 parametric option as to (lack of) case-assigning potential of deverbal nouns? I think that a different interpretation is more plausible. Namely, learners of English know that the genitive in this language is related with a [+animate] non-head DP. The fact that the genitive inside NNCs in which there is an ‘-er’ suffix for ‘agent’ and, therefore, also a [+animate] feature is preferred by the ADV more than the genitive inside NNCs whose both members have a [-animate] feature reveals that judgements in this group are affected by the semantics of the compounds. Hence, given also the paced nature of the GJT, they respond more favourably to, for example, ‘dolls’ importers’ than to ‘trucks’ industries’. Therefore it seems that no parameter resetting of the related L1 formal property has taken place for either of the two learner groups. Furthermore, it is interesting to note that if this analysis is correct, the advanced learners’ judgements on genitive NHN in compounds are affected neither by an L1 nor by an L2 property, since the [+/-animacy] feature is not related with genitive marking in Greek and in English it is related with the non-head DP, not the head DP.

Based on the above, I suggest that the L2 compounds constitute complex DP phrases resulting from XP movement. When the head DP contains a root nominal, they have the structure demonstrated in (13).

The non-head DP (DP₂) is base-generated lower than the head DP (DP₁) and due to L1 effect, D₂ moves to the covert P attracted by its strong nominal element (D*). This results in a P+D fusion, which has the morpho(phono)logical reflex of marking the DP₂ with genitive case (cf. Bouba 2000). Subsequently, the DP₂ moves to the Spec of the FP for Case which, as discussed, has been
(13) the toys' factory

postulated for Greek due to the strong agreement features between the DP members in this language. The extra determiner at Spec FP is eliminated at PF due to the identity of its features with the features of the determiner found at the higher node.

The structure proposed next in (14) regards genitive NHN in the L2 deverbal compounds.

(14) the cigars' maker
Like in (13), in (14) there is movement of the non-head DP which lands in Spec FP (Case), after it has been assigned the genitive case by the deverbal head DP. The extra determiner is eliminated in the familiar way.

Note that the interlanguage structure is unlike the L1 MG genitive structure in that in the latter, a prenominal non-head DP is in A' position at spec, DP (see 10b). On the other hand, in this respect it is the same as the one proposed for the abdominal genitive in Classical Greek (e.g. ο του βασιλέως θρόνον [thenom the-gen king-gen throne-nom] ‘the king's throne’) by Manolesou (2000). Importantly then, the interlanguage structures proposed are part neither of the L1 nor of the L2 but abide by the principles of UG.

As to the nature of ultimate attainment in adult language acquisition, in lack of near-native participants, I will speculate based on the performance of 9 of the learners who had a score of 180-189 at the OPT, which stands for ‘very advanced - professional users’ (Allan 1992: 89). Those learners too differed significantly from the NS at $p<0.05$ in their performance regarding genitive NHN in deverbal compounds. Therefore the L1 effects discussed here probably persist even at the ultimate attainment state of the L2.

All said, these findings are consonant with the hypothesis that adult L2 acquisition is guided by UG principles but “parameter resetting is unavailable ... especially when the parametric features involved are non-interpretable at LF” (Tsimipi 1997: 236; see also Hawkins and Chan 1997: 216-221, as well as Tsimipi 2003: 223-224). Further research based on a larger sample of items would substantiate the present findings.

References


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Appendix I

Examples from the picture-naming task

onion bread

face towel

Appendix 2

A sample of the grammaticality judgement task

1. Mosquito traps are very useful in the summer
2. It's definitely not raining
3. Her parents have a hat's company
4. I'll forget never my holidays in Santorini
5. This place is the toys’ museum
6. I once a month go to the theatre
7. Your book is on the towels box
8. He didn't pay for the teeth gel
9. Your hotel is quite near here
10. He writes poems about death
11. My sister is a bell's designer
12. Rarely does he go to church
13. Helen painted a mice cage