The status of -o- or on the allomorphy of neo-classical compounds
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A. Introduction

This paper aims at solving an old descriptive problem in dealing with neoclassical compounds: the status of the segment –o– which usually appears between the two elements of neoclassical compounds as in hamburgerology, buyology, bacteriology and epidemiology.

B. Status of –o– in words such as photograph and bacteriology

Bauer (1998:406) notices that ‘(t)here is one major descriptive problem in dealing with neoclassical compounds in English, and that is the status of the –o– ’ in these forms. “In Classical Greek, the –o was a thematic vowel, but it gradually became identified as a compositional linking element which is how it is analyzed in Modern Greek (…). The problem remains in current English [as well as in other languages as for instance French and Dutch ch] as how best to analyze the linking –o – in words like photograph. There are four possibilities:”

-(a) as a separate linking vowel, –o–, between phot and graph  
-(b) as part of the first element, which thus results in photo  
-(c) as part of the final element, which consequently must have the form ograph  
-(d) as part of both the first and the final element, which consequently must be photo and ograph

Option (a), –o– as a separate linking vowel, is the point of view usually taken by lexicographers. However, this description is ‘awkward’ according to Bauer (1998:406), since one rarely finds the English form phot, which should be one of the building blocks of the word photograph when –o– is a linking element. Only in words such as photic and photopsy one may come across phot.

According to Bauer (ibid.) –o– may be described as part of the first element, which is option (b), ‘on the grounds that when the first element is attached to lexemes it takes the –o– with it (photoluminescence)’. This solution ‘appears to commend itself to native intuitions, in the sense that clippings invariably keep the –o, for instance (photo).’

However, this description implies that we have to accept two forms next to each other such as hamburger and hamburgero, bacteria and bacterio, and may be even cinema and cinemato from cinematography. Moreover, one has to add a rule that truncates the last segment of the first element in some cases and puts the –o in its place.

Furthermore, the second description does not work very well for quasi-English Dutch neologisms such as

(1) nailotheek ‘nail center’
hairrothek  ‘hairdresser’
soupology  ‘art of making soup’

Also in these cases one has to accept nowhere attested forms as the ones given in (a) next to existing English nouns such as nail, hair and soup.

The same with

(2) tassology  ‘fortune telling by interpreting patterns of tea leaves’
tasseography
tasseomany

The first constituent of these three English forms is the French loanword tasse ‘cup’.

However, following Bauer’s suggestion we should get three forms next to each other:

(3)*tasso
*tasseo
	tasse  as in demitasse

By implication the fourth solution – the linking element –o– as part of both the first and the final constituent – does not work either. After all, also in this case nowhere attested double forms should be accepted.

So, logically only the third option should remain. However, Bauer (ibid) considers possibility (c ‘as perhaps the least likely’. Why so, he does not make clear.

Although this description is not very likely according to him, Bauer supplies an argument for option (c), which is that ‘when the second element is attached to lexemes it takes the –o– with it (Adressograph, phraseograph).’ Note that this is precisely the opposite of the argument he uses in the case of option (b), where the first part photo seems to take the –o–.

Moreover, Bauer does not consider possible counterexamples such as serigraphy and serigraph, where there is no –o– at all.

Option (c) implies that we have to accept allomorphs such as –logy and –ology and –graph and –ograph next to each other. See for instance bio-logy versus dialect-ology or genealogy, mammalogy and mineralogy where there is no linking –o– whatsoever.

This point of view, the existence of allomorphy of the second constituent, will be argued for in this paper.

Since Bauer can not find convincing arguments for one of the four options, he does ‘not attempt to solve the problem’. Also Bauer, Lieber& Plag (2013: 456) do not opt for one specific description. They present both options (d) and (a).

C. The linking element in French neoclassical compounds

Amiot  and Dal (2007:323) describe and analyze the different linking elements which are typical for French neoclassical compounds. There are two different vowels –i– and –o–, as in omnivore and deïsme at the one hand and ludothèque and théologie on the other. The choice between the two possible linking elements is based on etymology. Generally ‘–o–’ appears when at least one of the constituents has a Greek origin – ludothèque, cassettothèque – and
–i– when at least one has a Latin origin – *omnivore, herbicide.* “But –o– is more common than –i– because it also appears when only one constituent is of Greek origin (such as *ludoédutatif*1 ‘edutainment’, *cytochimie*2 ‘cytochemistry’) or with non-neoclassical combing forms (as in *afro-cubain* ‘Afro-Cuban’, *electroaimant* ‘electromagnet’).”

This observation seems to be correct and appears to hold for other languages as well, since in English one finds *omnipresent* and *omnivore* next to *theology* and *heterodox.* The first forms stem from a Latin base *omnis* ‘everything’ and *praesent* – ‘present’ or –*vorus* ‘eater’ respectively and the last ones from a Greek base *theos* ‘god’ and *logos* ‘word’ or *heteros* ‘other’ and *doxa* ‘opinion’. However, one can not exclude that these English neoclassical compounds, or their Dutch equivalents, have been borrowed directly from French.

Moreover, what to do with a neoclassical compound that combines a Greek and a Latin constituent. Is there a competition between –i– and –o or does one of the possible linking elements prevail? Forms such as *herbology* from Latin *herba* ‘herbs’ and Greek *logos* ‘word’ or the French *ludothèque* which combines a Latin root *lud–* ‘play’ and a Greek form *thêkè* ‘receptable’ suggest that in this case –o– prevails, which conforms Amiot’s and Dal’s observation that –o– is more common.

However, the main problem with this etymological explanation is how to predict the choice of a naïve language user, not being a well educated classicist. How does he/she know whether to put in an –i– or an –o–?

The account presented by Amiot and Dal may offer a fair description of the historical development; however, it is not a workable synchronic hypothesis.

**D. How resegmentation leads to allomorphy:**

In order to find a more adequate description an analysis of a few more examples may help. All examples are from English and they all end in –*logy*.

(3)   bio-logy   (4)   bi-ology   (5)   dialect-ology
    theo-logy   the-ology   kremlin-ology
    philo-logy   phil-o-logy   buy-ology

The neoclassical compounds in (3) share a ‘suffix’, –*logy*, but at the same time they share an identical ‘constituent’ –*ology*, which leads to resegmentation as in (4). Resegmentation is a kind of reanalysis (Fertig 2013:27). This process causes the misunderstanding among naïve language users that –*ology* is also a kind of a suffix. Subsequently this new suffix becomes productive, as the examples in (5) show.

This process of reinterpretation is not restricted to neoclassical compounds. Fertig (2013:32-33) describes this process as an instance of what he calls B-reanalysis:

“More significant for morphological change are B-reanalyses that do not create rules out of coincidental patterns but rather change what existing rules do. This occurs frequently when the reanalysis affects the location of a boundary between stem and affix. A well-known example involves the Germanic suffix that became English –*ness*.”

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1 Which of the constituents should be of Greek origin in this word is unclear: *ludo* is related to the Latin root *lud–* ‘play’ and *édutatif* to Latin *educare* ‘educate’.

2 Also this example is disputable since both constituents go back to a Greek origin: *kytos* ‘hollow’ and *khymeia* ‘chemistry’.

3 In English main stress falls on the first vowel of the final constituent *ólogy*. Thus the examples under (3) show the following stress pattern *biólogy, theólogy, philólogy* which may offer an extra argument for resegmentation after the first syllable. The more where stress remains on –*ology* in the examples under (5) *dialectólogy, kremlinólogy* and *buíology*. However, in Dutch and French where a similar process operates stress falls on other segments: Dutch *biologie, dialectologie*, French *théologiè* and *dialectologiè*.
The corresponding suffix in proto-Germanic was –assu. This suffix was frequently attached to stems ending in –n, and this n was subsequently reanalyzed as belonging to the suffix rather than the stem. In Old English, we find examples based on past participles, such as forgifeness ‘forgiveness’, which could still be analyzed as forgif fn + ess, but also many instances based on adjectives, such as godness ‘goodness’ or beorhtness ‘brightness’, which provide unambiguous evidence of the reanalysis and the new productive rule of –ness suffixation. Similar reanalyses give us the common Germanic suffix –ling – as in English darling, sapling, nestling, etc. – from attachment of –ing (OED –ing, suffix³ ‘one belonging to’) to stems ending in l, as well as the German suffixes –ner and –ler, attributable to words where –er was attached to stems ending in –n or –l and then extended to give us new words such as Rentner ‘pensioner’< Rente ‘pension’ and Sportler ‘sportsman’. Of more limited consequence (so far, at least) are examples such as the resegmentation of icicle, originally ice + ickle, to yield the new formative –sicle, as in popsicle, cream-sicle, juicesicle etc.”

Not all the resegmentations given here lead to the same result. For instance –ness completely replaced –ess – the suffix –ess which still can be found in Modern English is a different suffix and denotes feminine substantives parallel to masculine personal substantives (Marchand 1969: 286) – whereas –ling appears next to –ing and to –eling, as in sweeting, softling and squireling, starveling and fledg(e)ling (Marchand 1969: 305 & 327-329).

For Zabrocki (1980:107-108) the development of the Germanic suffix –ing into –ling and –eling was an argument for the psychological reality of his theory of diacrisis or distinctive morphology, which says that the boundaries suggested by identical elements, confusive elements as he calls them, are stronger than morphological boundaries. In Ohg. one finds the word bur-Ing ‘farmer’, from bur ‘house’ + –ing. The same suffix –ing appeared in words such as edeling ‘noble man’ and wihseling ‘changeling’, where it was attached to a stem ending in l. The language users recognized an identical constituent in both forms and therefore concluded that the forms should be (re)segmented into ede-ling and wihse-ling, or even into ed-eling and wihs-eling. Resegmentation into ede + –ling and wihse + –ling led to a new suffix –ling, which produced German smerling ‘falcon’. The ‘confusive’ constituent –eling gave rise to the Dutch forms vreemdeling ‘foreigner’ from vreemd ‘foreign’, jongeling ‘youngster’, from jong ‘young’, slappeling ‘weakling’, from slap ‘weak’, zwakkeling ‘weakling’, from zwak ‘weak’, stommeling ‘idiot’ from stom ‘stupid’ etc. Next to the suffix –eling Dutch also keeps the productive allomorph –ling: groenling ‘greenfinch’, zaailing ‘seedling’.

This kind of examples brings Zabrocki (1980:108) to the conclusion : “Die Struktur der distinktiven Morphologie besitzt eine nicht zu unterschätzende Bedeutung sowohl im Funktionieren wie auch in der Entwickelung der Sprache,” by which he means that corresponding identical constituents are of more importance for the structure of the language as the language user this perceives and therefore also for the historical development of the language.

Now back to the allomorphs –logy and –ology as analyzed in (3) –(5). The process which operates in (3) –(5) is the same as the process of resegmentation that Fertig, Marchand and Zabrocki describe for stem plus affix, albeit each in different terms. And it is not all specific for neoclassical compounds. The only special feature is that in neoclassical compounds usually the segment –o– plays a role whereas in the examples provided by Fertig, Marchand and Zabrocki the choice of extra segments is wider. This difference has an etymological background.
However, there seems to be a formal difference between –logy/–ology and for instance –ling/–eling. The second constituents of neoclassical compounds, also called combing forms, seem not to combine with non-neoclassical constituents, whereas this kind of restrictions does not apply to –ling/–eling.

A further analysis of the examples (3) – (5) shows on the one hand that the allomorph –ology does not require a neo-classical first constituent, as may be concluded from the last two examples of (5). At the other hand the meaning of some of these non-neoclassical compounds such as ‘buyology’, ‘boyology’ or ‘soupology’ is usually jocular, which suggests that here a conscious process of word formation may have taken place.

In addition, –ology seems not to be restricted to first constituents ending in a consonant:

(6) epidemiology
    Assyriology
    acuology ‘study of the use of needles for therapeutic purposes, as in acupuncture’

However, it is clear that in these examples glide insertion occurs before –ology.

The analysis presented here suggests that there is no essential difference between derivational, as in the case of stem plus affix, and neoclassical compounding in this respect. It is clear one can not equate neoclassical compounding and derivation completely, since that would lead to a possible description of the form biology as combination of two affixes, bio– and –logy, which is against the basic assumptions of compounding that a complex word should contain at least one unbound form. However, the examples analysed here show clearly that, when it comes to resegmentation, there is no essential difference between neoclassical compounds and derivation, proving once more that the boundary between compounding and derivation is blurred. The morphological status of the neoclassical elements discussed here is more suffix-like in terms of an allomorphic development than that of a bound root. Against this point of view Bauer, Lieber & Plag (2013:441-442) defend the position that neoclassical formations are best treated as compounds, but containing a non-native element that is obligatorily bound. As a consequence they have to accept a special status for –o– as well as for –i–.

E. Productive patterns

The emergence of new allomorphs is not restricted to the well known examples given before. It is a very frequent process as the following examples show:

(7) –theek/–otheek (Dutch)
    bibliotheek
    apotheek
    artotheek
    nailotheek

(8) –drome/–odrome
    hippodrome
    cartodrome
    velodrome
    tankodrome

(9) –cacy/–ocracy/–tocracy
democracy    teamocracy
sociocracy    dollarocracy
bureaucracy    expertocracy
adhocracy
partycracy
aristocracy    meritocracy
plutocracy    partitocracy
cleptocracy    pantocracy

(10)  –phil(e) / –oph(e)le
bibliophile    beerophile
anglophone    yankophile

(11)  –cide/–icid(e) / –ticid(e) / –(t)ricid(e)
genocide    ethnocide
gynecide    deicide
omnicide    suicide
regicide    homicide
parricide    tyrannicide
vaticide    giganticide
infanticide    foeticide/feticide
rodenticide    fan-ticide
patricide    vatricide

(12)  –teria and –eteria (non neo-classical forms)
cafeteria    snacketeria
chapelteria    soupeteria
fruiteria    sexeteria

F. Conclusion

The question about the status of –o– in neoclassical compounds, as asked by Bauer (1998), is not a relevant one. The element –o– turns out not to be independent, but part of an allomorph. The choice between the allomorphs is a matter of the phonological structure of the first constituent or of the preferred prosodic morphological structure of the output of the word formation process, just as with allomorphs of traditional suffixes. A precise description of this process is outside the scope of this study.

References
Bauer, Laurie (1998). Is there a class of neoclassical compounds and if so is it productive? Linguistics 36: 403-422.

4 Examples taken from Beelen (2004)
5 From Donald Barthelme’s novel Snow White (1967), where Bill, the leader of the seven dwarfs, is killed since he left the fire go out under the vats in which they produced Chinese baby food.

