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Arguments of non-heads*

Holden Härtl

1. Introduction

It is over twenty years ago that Susan Olsen and Gisbert Fanselow took opposite perspectives as to whether the formation and interpretation of complex words is based on regularities of core grammar or not, see Fanselow (1989), (1991) and Olsen (1991), (1992).¹ But note how relevant the subject matter still is today: While Gisbert Fanselow argued against an exclusive word structure component of the language faculty and attributed the interpretation of compounds to general conceptual-semantic principles, Susan Olsen maintained the view that word-formation operations such as argument inheritance are structurally regular and thus part of UG.

Clearly, both views have their merits. On the one hand, a conceptual perspective towards word-formation, like Fanselow's, allows a uniform treatment of argument-structural dependencies occurring in compounds and, thus, certain semantic parallels between different types of compounds involving thematic relations are predicted. For example, synthetic compounds like *Kastanienesser* (*chestnut eater*) as well as verb-noun compounds like *Esskastanie* ('eat_chestnut', *chestnut*) both involve a nominal representing a theme, i.e., *chestnut*, of the verbal predicate *ess-*, and this nominal could be argued to be conceptually associated with the verb's corresponding argument slot in both cases. On the other hand, there are characteristic regularities, like the well-known (and much debated) *Right Hand Head Rule*, see Williams (1981: 248), which suggest a more restricted rule system may be at work here and thus the existence of a separate, word-formation-specific grammatical domain. In this context, for example, the (also often-discussed) ban on external arguments to appear within a complex nominal, cf. **child-sleeper*, **girl-writing* (see Grimshaw 1990 among others), could be considered an expression of a particular morphological restriction holding exclusively in word-formation patterns.

Large parts of the discussion in the literature on the above issue center around aspects of argument inheritance in deverbal nouns and if this is a syntactically rooted operation or not.

* I wish to thank Sven Kotowski, Andrew McIntyre and the audiences of the annual workshops "Event Semantics" in Tübingen (2010) as well as Flensburg (2011) for useful comments and discussion.

¹ About sixteen years ago, the aforementioned papers were my first encounters with system-theoretical aspects of word-formation and morphology, in general. I therefore dedicate this paper to Susan Olsen, to whom I owe so much.

A standard assumption maintains that deverbal *er*-nominals, in some way, inherit the object arguments of the verbal base of the head noun, cf. *baker of bread*, *giver of presents to children*, see, among others, Lieber (2004: 61f.). Less attention, though, has been paid to arguments of non-heads and the question if a thematic relation between a predicate in a non-head position and an expression “outside” the compound is based on structural argument inheritance processes or not. Consider the following examples:

- (1) a. Fahrgemeinschaft nach Italien
ride_community to Italy
‘ride sharing to Italy’
b. Ausreiseverbot in die BRD
departure_ban into the FRG
‘ban on traveling to West Germany’
c. Anschlagversuch auf Ackermann
attack_attempt on Ackerman
‘attempted attack on Ackerman’
d. Umsteigepunkt zu den documenta-Stätten
change_point to the documenta_locations
‘interchange point to the ...’

The examples all contain a predicate, e.g., *fahr-* in (1)a, located in the non-head position of a compound, which is accompanied by a phrase (i.e., *nach Italien*) apparently serving as the argument of the non-head predicate. The pattern is linguistically marked² to a considerable extent but exhibits a significant degree of productivity so that we cannot simply move these expressions into the realm of performance-based slips. From a prescriptive viewpoint, attachments to non-heads of this kind have occasionally been described as “incorrect” (cf., for example, DUDEN *Richtiges und gutes Deutsch*: 507f.)—which, however, does not match descriptive reality as, intuitively, certain structural factors seem to play a role in the formation of the construction. For example, we can plausibly argue aspects of linguistic economy to be involved in (1) if we consider the complexity and clumsiness of (per se regular) morphologically formed correspondents like, e.g., *documenta-Stätten-Umsteigepunkt* for (1)d. Besides, certain instances of thematic relations between non-head and post-nominal phrase are considerably less marked, as in, for example, *Designanalyse des Geschirrs* (‘design_analysis of the dinnerware’), where *des Geschirrs* can be argued too to saturate the argument slot of the (relational) non-head noun, i.e. *Design*. Note, however, that in this case the post-nominal DP functions as an argument of the head noun *Analyse* also; a circumstance which could provide an anchor point to explain the unconditioned acceptability of this type of construction.

The current paper investigates these cases from a lexicalist perspective. In particular, I will discuss whether realizations of arguments of non-heads of the above types are based on a regular grammatical³ process or not. I will argue that this is the case indeed with constructions of the type *Designanalyse des Geschirrs*, where the post-nominal element figures as

² Here, *markedness* relates to the notion of grammatical / linguistic acceptability. The more acceptable an expression is, the less marked it is considered.

³ *Grammatical* does not mean *syntactic*.

argument of both the head as well as the non-head. In contrast, (prepositional) external argument realizations of the type in (1)—i.e. constructions in which the post-nominal element satisfies an argument slot of the non-head predicate alone—will be approached from a non-grammatical, pragmatically oriented perspective.

In the second part of the paper, I will take a closer look upon verb-noun compounds like *Fahrgemeinschaft* in (1)a, *Sägewerk* (*sawmill*) etc. I will claim that the argument variables of the verbal non-heads are nevertheless lexically still active after the word-formation process, that is, in some way “inherited” to the compound. At this point it is vital to note that my assumptions do not necessarily imply a syntactic feature percolation operation (as proposed by, e.g., Harley 2008). Rather, I will assume a (lexical-semantic) operation of function composition to be at work in constructions like *Designanalyse des Geschirrs*. Furthermore, based on insights from PRO-configurations as well as sentential complements, I will implement a lexical-structural projection below the word level, under the assumption of two separate grammatical domains, i.e., syntax and morphology, which share a common generative structure building apparatus.

2. Some problems for conditions on argument inheritance

Argument-structural restrictions on word-formation patterns have been associated with a broad array of principles and conditions, which we cannot even come close to describe in their entirety in this paper; see Baeskow (2011) and Härtl (2011) for overviews. A classic example is the above-mentioned sanction against external arguments in complex deverbal nominals, a restriction also formulated in Selkirk’s (1982) *Subject Condition*. Note, however, that the condition is watered down by examples in which subjects are nevertheless realized within compounds. For instance, compounds based on intransitive verbs like *Hundeheulen* (‘dog_howling’) and *Möwengeschrei* (‘seagull_yelling’) and also complex adjectival participles like *experten-getestet* (‘expert_tested’) or *fachmann-geprüft* (‘specialist_inspected’) all contain what could conceivably be grammatically represented as an external argument of the verbal predicate in the non-head position; see Di Sciullo (1992) and her critical discussion of the *Subject Condition*. A potential way out could be to exclude intransitive verbal bases from the condition, cf. *Hundeheulen* vs. ^{??}*Hundefressen*⁴ (‘dog_eating’), which, however, entails a special treatment of the participles as the above examples contain transitive bases. Consider, on the other hand, that complex participles containing an agent argument are probably not based on a regular inheritance process, because novel expressions of this type are often marked, cf. ^{??}*großmutter-gestrickt* (‘grandmother_knitted’), ^{??}*professoren-gelehrt* (‘professor_taught’). Further, *experten-getestet* does not have a verbal pendant, cf. **experten-testen* (see, among others, Fuhrhop 2007 for details), which suggests that the “agent” nominal is attached *after* the adjectivization of the verbal base has taken place; see Maienborn and Gelderman (this volume) for such an analysis. Instead, what seems to play a key role in the licensing of this pattern is the conceptual salience of the

⁴ The latter example is odd with the—here intended—agent reading of the non-head.

property expressed with the adjective, which determines its interpretability and which makes its analysis as “synthetic” composite in the narrow sense redundant (see *ibid.*)

Rule-based accounts of argument inheritance are also challenged by apparent violations of the theta criterion. A standard analysis of complex nominalizations like *Personenbeschreibung* (‘person_description’) implies that the non-head element *person-* satisfies the internal argument slot of the predicate *beschreib-*; cf. Grimshaw (1990), Lieber (2004). This assumption, however, is less unproblematic in light of the option to add a genitive DP realizing a thematic function quite identical to the one of the non-head: *Personenbeschreibung des Täters* (‘person_description of the culprit’); see Solstad (2010) for discussion. Expressions like these seemingly violate the restriction, formulated by Di Sciullo (2005), that as soon as an argument position is satisfied within a compound, this position is no longer accessible to any compound-external DP as *meat-eating* (**a steak*) illustrates; cf. Di Sciullo (2005: 27) and also Baker (1998: 190). A potential explanation could be that phrases like *Personenbeschreibung des Täters* contain actually a (deverbal) root compound as syntactic head and that the genitive DP alone satisfies the internal argument slot of the deverbal element. This, however, has the unattractive implication of two distinct analyses to be applied to one and the same compound: (i) as root compound when accompanied by a genitive DP of the above type and (ii) when it occurs in isolation, as compound containing a non-head which saturates the predicate’s internal argument.⁵ To get a clearer picture, let us inspect some other examples exhibiting instances of apparent double argument saturation:⁶

- (2) a. Designanalyse des Geschirrs
 design_analysis of the dinnerware
 b. Namensanalyse des Flusses
 name_analysis of the river
 c. Stabilitätsprüfung der Dachkonstruktion
 stability_check of the roof_construction
 d. Belastbarkeitstest des Fahrzeuges
 capacity_test of the vehicle

Noticeably, the non-heads of the compounds in these examples are all relational in a broader sense: nouns like *design*, *name*, etc. have relational meanings and, thus, contain an additional argument variable: $\lambda y \lambda x. \text{NAME}(x, y)$. Upon closer inspection, it appears that this argument slot is consistently “saturated”⁷ by the genitive DP in the examples in (2), which is also indicated by the corresponding paraphrases: *Design des Geschirrs*, *Name des Flusses*, etc. This configuration gives us reason to believe that the apparent double argument saturation should rather be seen as external argument realization, i.e., an instance of the saturation of an argument of a non-head and, thus, similar to the constructions in (1) above.

⁵ This is expected under the *Argument Linking Principle*; see Lieber (1983: 258). It dictates that if a verbal head appears as sister to a (potential) internal argument that can figure as logical object this argument slot will be linked, i.e., saturated.

⁶ The examples in (2) are all extracted from Google results or adaptations thereof.

⁷ I am not implying a *syntactic* argument percolation (cf. Selkirk 1982) to be at work here. Below, I will assume a lexical-semantic anchoring of the mechanism in the lexically oriented style of Lieber (1983).

Note that this insight is bolstered by the ungrammaticality of examples like **Bonitätsprüfung der Liquidität* ('reliability_assessment of the solvency'), where the genitive DP *der Liquidität* cannot saturate the theme role of *Bonität*. Thus, it seems that for constructions like those in (2) to be felicitous a thematic relation between non-head and genitive DP needs to be construable. From a structural viewpoint, a dependency like this, however, violates several grammatical principles, among them the *Head Principle* formulated in Selkirk (1982), which holds that only arguments of heads can be satisfied whereas arguments of non-heads are blocked from linking, cf. *baker of bread* vs. **baking man of bread*. Hence, the question is raised if constructions like the ones in (1) and (2) are indeed grammatically licensed or if they should rather be explained on a pragmatic-conceptual basis—which, in turn, connects to the original question about the locus of word-formation in the language system. Note that two separate analyses for (1) and (2) may be also conceivable in light of the fact that only the latter have pendants which are acceptable with simplex head nouns, cf. *Analyse des Geschirrs* ('analysis of the dinnerware') vs. **Gemeinschaft nach Italien* in (1)a above. In the following section I will address this issue. First, I will review some previous analyses of arguments of non-heads and consider the implications for an analysis of outside argumental genitive DPs. In the second part, I will concentrate on verb-noun compounds like *Fahrgemeinschaft*, *Tauchanzug* ('dive_suit', *diving suit*), etc. and their grammatical behavior in this respect.

3. Inheritance of arguments of non-heads

Note that attachments of a phrasal element to the non-head of the type in (1), i.e., constructions like *Fahrgemeinschaft nach Italien*, are restricted to arguments, while adjuncts seem to be generally excluded in this configuration, cf. ^{??}*Fahrgemeinschaft mit dem Volkswagen*. Should we therefore analyze felicitous constructions of this type as the result of a structural mechanism of argument inheritance—wherever in the grammatical system we wish to locate it?

3.1. Some previous analyses and their implications

From a lexicalist viewpoint, Höhle (1982) argued that cases like *Wartezeit auf den Arzt* ('wait_time for the doctor') are indeed instances of grammatical argument inheritance, which are, however, significantly restricted in their productivity by idiosyncratic properties of the head nouns. While the author remains silent about the exact nature of these properties, Fabricius-Hansen (1993) identifies a restriction to be at work here, which limits external argument realizations to constructions in which head noun and argument phrase together constitute a syntactically and semantically possible noun phrase (ibid.: 230). This criterion would explain why a construction like *Designanalyse des Geschirrs* (see (2)a above) is considerably more acceptable than, e.g., ^{??}*Nachfolgefrage des Bürgermeisters*⁸ ('suc-

⁸ Observe that grammaticality judgments are notoriously difficult in this domain. For example, Fabricius-Hansen (1993: 229) considers *Nachfolgefrage Brandts* ('succession_question Brandt's')

cession_question of the mayor’) because in the former, but not in the latter case, the head noun and the genitive DP form a semantically coherent constituent. Besides, Wunderlich (1986) discusses aspects of lexicalization to be relevant in the formation of constructions of this type. He maintains that lexicalized complex nouns are available to external argument realization to a lesser extent in comparison to novel formations, which would explain the contrast between **Sprechzimmer mit dem Direktor* (‘speak_room to the director’) and *Verhandlungszimmer mit dem Direktor* (‘negotiation_room with the director’); see *ibid.*: 224 and also Fabricius-Hansen (1993: 231).

We can conclude that extra-grammatical factors are at work to a significant extent here, which control the creation of the constructions in question. Regarding productivity and linguistic acceptability as the decisive criteria, we have reason to believe that constructions with an argumental genitive DP of the type in (3), i.e., a DP satisfying an argument *exclusively* of the non-head, should be analyzed based on pragmatic grounds:⁹

- (3) Pattern I: [[NON-HEAD_i HEAD] DP-GEN_{ARG-I}]
- a. Abrissgenehmigung des schnellen Brütlers
demolition_permit of the fast breeder reactor
(from Wunderlich 1986: 224)
- b. Absturzursache des Flugzeugs
crash_cause of the airplane
(from Fabricius-Hansen 1993: 197)
- c. Impfpflicht des Truthahngeflügels
vaccinate_obligation of the turkey_poultry
(based on an example I heard)¹⁰

I am not claiming that occurrences of this type should generally be considered performance-based slips of the tongue. However, due to their limited productivity and, in particular, because of their noticeable departure from the usual acceptability standards, constructions like those in (3) can be surmised to be occasional formations which are licensed through pragmatic intervention. This may be based on the well-known conversational maxims (see Grice 1975), which, among other things, regulate a linguistic expression to be communicatively economical, to the extent that the expression remains interpretable. For example, due to its length, the grammatically regular pendant for (3)c, i.e., *Truthahngeflügelimpfpflicht*, appears

to be better than *Reisemöglichkeit nach Bonn* (‘travel_opportunity to Bonn’), which, however, is against my own intuition. Likewise, the judgments for constructions of the type *Verhandlungszimmer mit dem Direktor* (see below) vary considerably; compare Fabricius-Hansen (1993: 195) and Wunderlich (1986: 224), see also Toman (1987: 61). See also McIntyre (2012) for a discussion of idiolectal aspects relevant in this context.

⁹ A pragmatic analysis is compatible with an observation made in McIntyre (2012), who points out that the argumental genitive DPs like in (3) are systematically optional. Therefore, McIntyre proposes a semantic-conceptual approach in which—according to McIntyre—the genitive DPs are licensed by the fact that the (complex) head nouns are inherently relational.

¹⁰ Note that the kind reading for the genitive DP is intended in this example; see, among others, Krifka et al. (1995) for details. We cannot go into the details of the complex interplay between the name giving function of compounds and kind interpretations of nominals but see, among others, Bücking (2010), Kotowski et al. (2012) for more.

rather odd from a functional-communicative point of view. Consequently, a less “heavy” genitive DP argument should lead to a higher degree of markedness when realized externally, which indeed seems to be the case, cf. ¹¹*Impfpflicht des Wildes* (‘vaccinate_obligation of the wild_animal’), with the possible explanation that the grammatically regular and thus more conventional expression *Wildimpfpflicht* would do the job perfectly.

Note that an alternative reading is conceivable for (3)c, in which the genitive DP is also linked to the nominal argument of the relational noun *Pflicht* (‘obligation’), producing the somewhat peculiar interpretation for the terriers themselves to be under the expressed obligation. This interpretation corresponds to the configuration displayed in (2) above, where *both* the head and the non-head stand in a thematic relation to the genitive DP. Some additional examples are given in (4):

- (4) Pattern II: [[NON-HEAD_i HEAD_j] DP-GEN_{ARG-1/j}]
- a. Oberflächenzerteilung des Knochens
surface_dispersion of the bone
 - b. Unterbodenreinigung des Fahrzeuges
undercarriage_cleaning of the vehicle
 - c. Persönlichkeitscheck des Bewerbers
personality_check of the applicant

Constructions of this type, displaying instances of apparent double argument linking, exhibit certain resemblances to the expressions in (3). For example, their paraphrases are structurally identical:

- (5) a. Oberflächenzerteilung des Knochens → Zerteilung der Oberfläche des Knochens
b. Absturzursache des Flugzeugs → Ursache des Absturzes des Flugzeugs

In contrast to that in (3), however, the pattern displayed in (4) and (2) is fully regular and linguistically unmarked and, crucially, with the latter the internal argument variable of the deverbal head is compatible with the ontological-semantic type of the genitive DP. In accordance with the argumentation in Fabricius-Hansen (1993), see above, I will argue that that this is a vital licensing condition for the construction, explaining its unmarkedness. Pursuing this view, we can assume the construction to be based on a regular grammatical pattern—be it “morphological” or “syntactic”. The structure can be argued to have its formal, lexical-semantic reflexes in an operation of functional composition $\alpha/\beta \beta/\gamma \rightarrow \alpha/\gamma$, in which two functions are combined and unsaturated arguments are inherited to the function resulting from the composition.¹¹ Informally speaking, for example, in (4)a, the relational nominal *Oberfläche*, representing a function itself, is applied to the deverbal *Zerteilung*¹² to satisfy its internal argument. In this operation, the relational argument of *Oberfläche* is inherited to the resulting expression (i.e., *Oberflächenzerteilung*), which will then be saturated by the genitive DP.

¹¹ See Bierwisch (1989) and Gamerschlag (2005) and, in particular, also the discussion in Fanselow (1991: 16f.), who argues against an approach making use of functional composition to derive the interpretation of compounds containing a predicate non-head.

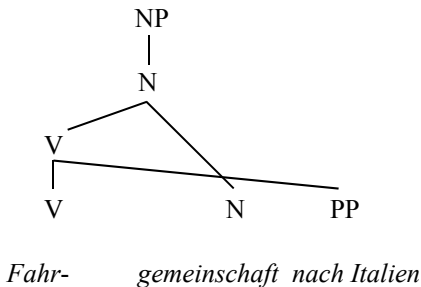
¹² Aspects of the derivation of the *ung*-nominalization are ignored here; see Bierwisch (1989), (2009), and Ehrich and Rapp (2000) for a discussion of the relevant aspects.

So far I have argued for two distinct analyses of external argument realization. The first analysis applies to constructions of the type *Absturzursache des Flugzeugs*, as in (3), where I have opted for a pragmatic approach on grounds of the conversational maxims. The second analysis concerns constructions of the type in (2) and (4), which I consider to be based on grammatical principles and to have its reflexes in functional composition, i.e., a lexical-semantic operation. Assuming two separate analyses for external argument realization leaves us unsure about which of the two analyses should be applied to externally realized arguments of non-heads in verb-noun compounds, that is, constructions of the type in (1). On the one hand, an expression like *Fahrgemeinschaft nach Italien* is—at least to my mind—significantly more acceptable than *Absturzursache des Flugzeugs*, which moves the former closer to the domain of grammatical regularity. On the other hand, as is pointed out in Härtl (2012), external argument realizations of the type in (1) cannot easily be argued to be productive—something we would expect from a regular grammatical option—as many prepositional objects are in fact blocked from being “inherited” in the above sense, cf. ^{??}*Auswanderphantasie nach Neuseeland* (‘emigrate_fantasy to New Zealand’) or ^{??}*Steiganleitung auf Kirchdächer* (‘climb_instruction on church_roofs’).

3.2. The case of verb-noun compounds

Note that a grammatically anchored approach towards external argument realizations in verb-noun compounds (VNC) would imply a violation of the *Principle of lexical integrity* (see, among others, Anderson 1992, Booij 2009, Egg (this volume)), which blocks external access to word-internal elements. The structure in (6) illustrates the problem on a pre-theoretical level.¹³

(6) *Fahrgemeinschaft nach Italien*



Let us have a brief look at some lexical-semantic characteristics of VNCs in German. To begin with, the word-formation pattern is fully productive and can involve all possible thematic relations between dependent and head: for instance, an agentive role as in *Tanzbär* (*dancing bear*), a theme role (*Lesebuch* (*reading book*)), or a locative role (*Esszimmer* (*din-*

¹³ We have to leave it for future research to ask to what extent an analysis for (6) should be on a par with the one covering the well-known bracketing paradox, as displayed in *[[functional grammar] -ian]*; cf., e.g., Booij 2009. Observe that in the latter case, too, a modifier (i.e., *functional*) relates to a non-head element (*grammar*). I wish to thank André Meinunger for the discussion about this point.

ing room)); cf. Donalis (2005). The majority of VNCs are endocentric in German although a couple of exocentric ones also exist, such as, for example, *Schreihals* ('scream_throat', *screaming child*) or *Plappermaul* (*chatterbox*). In contrast to German, in English the fully productive counterpart is provided by the pattern VERB-ing NOUN, cf. *swimming cap*, *drawing board*. Another difference between German and English is that English has exocentric "imperative" VNCs (corresponding to the productive pattern in Romance languages), in which the head noun functions as the internal argument of the verbal predicate, as in *pick-pocket* or *killjoy*; cf., among others, Gast (2008), Sauer (2004) for details. Lastly, in a number of VNCs, e.g., *Stinkedecke* ('stink_blanket') or *Riechesocken* ('smelling_socks'),¹⁴ the event variable of the verbal predicate can be argued to refer non-generically but specifically, which is reflected in the fact that their interpretation does not involve a kind in the sense that a subset of the head noun's extension is referred to; cf. Härtl (2012).

What evidence could be used to promote a pragmatic approach to the structural configuration displayed in (6)? First of all, as already mentioned above, this type of breakup of a word-internal structure is not generally available since adjuncts are blocked in this configuration, cf. *Fahrgemeinschaft *mit dem Volkswagen/*mit hoher Geschwindigkeit* ('at high speed'). Note that this does not necessarily provide evidence for a grammatical argument inheritance view towards external argument realizations of the type in (6): We may just as well declare conceptual-informational salience of the goal role to be responsible for the licensing of the construction. Note, furthermore, that argumental genitive DPs are considerably less regular in this configuration than prepositional argumental constituents: **Fahrerlaubnis des Motorrads* ('drive_license of the motorbike'), **Lesevergnügen des Bestsellers* ('read_enjoyment of the bestseller'). A possible explanation for this effect could again aim at the heaviness of prepositional phrases: A canonical realization of the goal argument within the compound, i.e., something like *Italienfahrgemeinschaft*, 'Italy_ride_community', removes the prepositional element and appears just as odd for functional-communicative reasons as the respective syntactic paraphrase *Gemeinschaft zur Fahrt nach Italien* ('community for a ride to Italy'). Furthermore, compound-internal realizations of goals and locations, respectively, are generally not fully regular in German (cf. ^{??}*Seespringer* ('lake_jumper'), ^{??}*Deckenbaumeln* ('ceiling_dangling'), ^{??}*Briefkasteneinwerfer* ('mailbox_thrower-inner')), which is another factor promoting a compound-external realization of prepositional arguments.¹⁵

That the heaviness of argumental PPs correlates with the option to realize them externally explains the contrast between **Aufnahmeverbot in die Mannschaft* ('admission_ban to the team') versus [?]*Aufnahmeverbot sowohl in die Nationalmannschaft als auch die Bundesligamannschaft* ('admission_ban to the national_team as well as the Bundesliga_team'),¹⁶ which, in turn, supports a pragmatic analysis of the construction. Additional support for a

¹⁴ Note that these forms often involve a linking element *-e-*, in contrast to the generic non-head predicates in clearly lexicalized VNCs of this kind, cf. *Stinktief* ('stink_animal', *skunk*), *Riechfläschchen* ('smell_bottle', *vinaigrette*). In how far the pattern can be regarded as productive must be left to future considerations.

¹⁵ I wish to thank Andrew McIntyre for this insight.

¹⁶ I wish to thank Andrew McIntyre for these examples.

pragmatic analysis for external argument realization in VNCs comes also from sentential arguments of the verbal non-head. Consider the following examples:

- (7) a. das Denkverbot, dass die Erde rund ist
 the think_ban that the earth is round
 b. das Mittelbedürfnis, dass man verliebt ist
 the tell_need that one is in love
 ‘the need to tell that you are in love’
 c. die Ignorier-Anweisung, dass der Wert überschritten wurde
 the ignore_command that the value has been exceeded

Evidently, sentential arguments, too, can be considered heavy elements and can thus, as such, be realized compound-externally, as the examples in (7) illustrate. This option is again accounted for by the functional oddity of the grammatically regular correspondent, which, in this case, is provided by a phrasal compound, cf. *Dass-die-Erde-rund-ist-Denkverbot*.¹⁷ We can conclude that the same pragmatically based analysis applied to Pattern I (e.g., *Absturzursache des Flugzeugs*) is also appropriate for external argument realizations in VNCs.

External argument realizations like those in (7) as well as in (1) and (3) demonstrate that the arguments of the non-heads involved have not been discarded in the corresponding word-formation process. That the argument variables are indeed still active can, for example, be deduced also from the fact that the slots can be saturated compound-internally in a canonical way, see the examples in (8):

- (8) Schuhputzzeug (shoe_clean_kit, ‘shoe cleaning kit’)
 Apfelschälmaschine (apple_peel_machine, ‘apple peeling machine’)
 Eisensägewerk (iron_saw_mill, ‘iron sawmill’)
 Schneekehrmaschine (snow_sweep_machine, ‘snow-sweeping machine’)

In these examples, the left-hand nominal element can be surmised to saturate the internal argument of the verbal non-head,¹⁸ which—just like the instances of external argument realizations examined above—challenges the traditional view that only arguments of (syntactic) heads can be saturated; cf. Selkirk (1982). Of course, as an alternative explanation, one may also maintain that in the underlying word-formation process root elements are combined that have abdicated any argument-structural potential; which would be well-suited to the fact that basically any type of modifier is acceptable in non-head positions of compounds.¹⁹ According to the latter view, the left-hand element in the examples in (8) wouldn’t represent an argument in the narrow sense of the verbal non-head after all; see

¹⁷ See Meibauer (2007) for a discussion on the expressivity (i.e., the linguistic markedness) of phrasal compounds.

¹⁸ For a more sophisticated discussion on the assignment of thematic roles stemming from non-heads, see, e.g., Boase-Beier and Toman (1986).

¹⁹ For example, agent arguments are, at least marginally, also acceptable in the respective position: *Männerputzkurs* (‘men_clean_seminar’, *men cleaning seminar*), as well as locative or temporal modifiers of the type *Frühjahrsputzplan* (‘spring_clean_schedule’, *spring cleaning schedule*). It should be obvious that these patterns are not limited to occur exclusively in verb-noun compounds but can be found with other types of compounds as well, cf. section 2 above.

Fanselow (1991) for such a view. However, the activeness of the argument slots of the verbal non-head can also be inferred from the fact that sentential arguments of VNCs, see (7) above, are licensed through the presence of the predicate in the non-head and, hence, corresponding simplex nouns render semantically deviant readings of the corresponding sentential complementations:

- (9) a. #das Verbot, dass die Erde rund ist
 ‘the ban that the earth is round’
 b. #das Bedürfnis, dass man verliebt ist
 ‘the need that one is in love’
 c. #die Anweisung, dass der Wert überschritten wurde
 ‘the command that the value has been exceeded’

Indications that the verb’s argument positions in VNCs are grammatically present also come from syntactic constructions involving control configurations. In a number of VNCs including control verbs, the implicit argument can be argued to control a PRO-element contained in a non-finite clause. Consider the following examples.²⁰

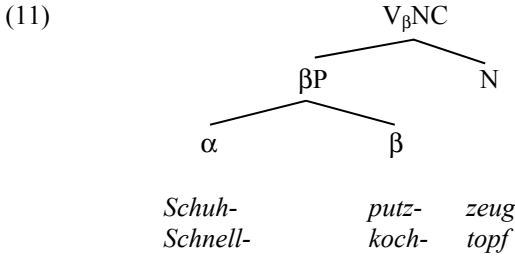
- (10) a. der *Bitt*brief [PRO Geld zu spenden]
 the ask_letter (‘petition’) [PRO to spend money]
 a’.??der Brief [PRO Geld zu spenden]
 b. das *Empfehl*schreiben [PRO das Urteil anzuerkennen]
 the recommend_letter (‘recommendation letter’) [PRO to accept the sentence]
 b’.??das Schreiben [PRO das Urteil anzuerkennen]
 c. die *Schwör*rede [PRO sich für die Bürger einzusetzen]
 the swear_speech (‘swearing-in speech’) [PRO to speak for the citizens]
 c’.??die Rede [PRO sich für die Bürger einzusetzen]

In the acceptable examples, see (10)a–c, the PRO-element can be argued to be controlled by an implicit argument of the verbal predicate in the VNCs. This is indicated, first, by the unacceptability of the examples in (10)a’–c’, containing simplex nouns, where no verbal argument structure is present and, second, by the varying PRO-reference, which is determined by the corresponding thematic argument: PRO is controlled by the verb’s indirect object in (10)a and (10)b, i.e., the one who is asked and the one who receives the recommendation, respectively, whereas in (10)c PRO is controlled by the subject, i.e., the one who swears.

In conclusion, we have good reason to assume that argument positions of the verbal dependent are grammatically still present in VNCs after the word-formation process has taken place. A question that is still open is how we can account for this insight from a grammatical point of view. From a lexicalist morphological perspective—and this is the one I would like to defend here—a syntactic analysis which relies on a formal argument inheritance operation is not plausible (cf., e.g., Lieber (1992, 2004) for a discussion). What I would like to propose instead is a structural projection below the word level: Argument saturation, phenomena like PRO-control and external sentential complements, as well as

²⁰ The compounds in (10) are all attested but archaic. The reason for this is that the pattern is no longer productive with the control verbs in question and has generally been replaced by the noun-noun pattern, cf., e.g., *Empfehlungsbeschluss* (‘recommendation_decision’).

adverbial modifications of the verbal non-head as in *Schnellkochtopf* ('fast_cook_pot', *pressure cooker*) suggest the presence of a (non-functional) lexical-structural projection in the VNCs' representation, as is illustrated in (11), see Härtl (2012) for details:



In this (tentative) representation, β is used to represent the verbal root, while α signifies the satellite of β , i.e., a modifier or an argument. It is vital to note that the proposed analysis does not imply the giving up of the boundary between morphology and syntax. Rather, the analysis is compatible with the assumption, from Ackema and Neeleman (2004, 2010), that morphology and syntax—standing in competitive relation to each other—are two separate domains of grammar that, however, share a common generative structure building apparatus. According to this view, canonical, unmarked structure building is rooted in syntax, which explains the unacceptability of expressions like **to truck-drive* as it is blocked by the syntactically produced alternative, i.e., *to drive a truck*. Besides, the notion of competition (possibly in the optimality-theoretic sense) relates suitably to the idea discussed above that pragmatic factors influence the choice of structure building route selected for a complex nominal. In such a framework, a theoretically solid basis can be given to the insight that the functional markedness of a morphological product such as *Dass-die-Erde-rund-ist-Denkverbot* (cf. (7)a) can pave the way for external argument realization as in *Denkverbot, dass die Erde rund ist*.

4. Conclusion

We have investigated arguments of non-heads against the background of the question as to whether thematic relations expressed in compounds are based on a grammatically anchored operation of argument inheritance or not. On closer inspection, (at least) two different interpretations of this question can be identified in the literature. On the one hand, we can ask if argument inheritance in compounds is a mechanism that is rooted in the grammatical system *at all* and, thus, a function of universal grammar. On the other hand, if we accept that argument inheritance exists, we can ask about its location *within* the grammatical system, where some scholars have argued argument inheritance to be a syntactic operation, while others have maintained it to be rooted in a separate, lexical-morphological system. Predominantly, these questions have been investigated with a particular focus on the argument-structural properties of deverbal heads, as in *dog owner* or *owner of a dog*.

The current paper has examined the argument-structural potential of the non-head of a compound and the conditions on external argument realizations (i) with an argumental geni-

tive DP as in *Absturzursache des Flugzeugs* ('crash_cause of the airplane') as well as *Designanalyse des Geschirrs* ('design_analysis of the dinnerware') and (ii) with argumental PPs of the type *Fahrgemeinschaft nach Italien* ('ride_community to Italy'), with a special focus on verb-noun compounds. For argumental genitive DPs as in *Absturzursache des Flugzeugs*, in which the genitive DP stands in a thematic relation only to the non-head, I have argued for a pragmatically-anchored analysis, based on conversational maxims à la Grice. For the second type, i.e., argumental genitive DPs which relate to both the head and the non-head as in *Designanalyse des Geschirrs*, I have proposed a grammatical analysis, which relies on a lexical-semantic operation of functional composition of the head noun predicate (*Analyse*) and the relational noun (*Design*). The argument "inherited" to the resulting expression is saturated by the genitive DP.

Note that the latter analysis does not necessarily imply a softening of the *Principal of lexical integrity*. However, the situation is different with VNCs, because here, just as with the argumental genitive DPs of pattern type I, the PP saturates the argument slot of the non-head alone. Thus, the pragmatic analysis I put forward above is less costly, considering lexical integrity as a grammatical directive; cf. Egg (this volume). Evidence on behalf of a pragmatic approach comes again from the "heaviness" of PPs as well as external argument realizations involving sentential arguments as in *Denkverbot, dass die Erde rund ist* ('think_ban that the earth is round').

The analyzed data indicate that the argument variables in question have not been discarded in the word-formation process involved. In fact, we have good reason to assume that they are active in the lexical representation underlying the expressions. Evidence comes from internal argument saturation as in *Schuhputzzeug* ('shoe_clean_kit') as well as the fact that externally realized sentential arguments are deviant if no verbal non-head is present, cf. *#Verbot, dass die Erde rund ist*. Finally, we have looked at configurations involving PRO, as in *Bittbrief, Geld zu spenden* ('ask_letter to spend money'), and concluded that the binding of PRO can be argued to be dependent on an implicit argument of the verbal non-head.

The above results lead us to the conclusion that there is a lexical-structural projection below the word level, see (11) above. I have argued such an analysis to be compatible with a lexicalist perspective, under the assumption of a model in which, competing with each other, syntax and morphology represent two distinct domains, which, however, rely on a common generative structure building apparatus.

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