

The diachronic increase in morphological complexity in German infinitive nominalization

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Abstract. Nominalized infinitives (NIs), such as (*das*) *Drehen* ‘(the) turning’ or (*das*) *Einkaufen* ‘(the) shopping’, are one of the most frequent deverbal nominalization patterns in present-day German. As a type of conversion (also “zero-derivation”), NIs are an interesting phenomenon for the investigation of differences between derivation and inflection, since NIs shed light on the differences between derivational processes. They are formed by conversion and only show a subset of the characteristics of nominals formed with true derivational affixes, such as *-ung*-nouns, with which they have competed historically in the deployment of German abstract nouns (such as *Drehung/Drehen*, but *Einkaufen*/**Einkaufung*). Despite some parallels between the two nominalization patterns, only NIs can nominalize verbal complexes with auxiliaries (such as (*das*) *Besucht-Haben* lit. ‘(the) having-visited’) and modal verbs (such as (*das*) *Besuchen-Müssen* lit. ‘(the) must-visiting’), which is opposed to derivation. Regarding the boundary between derivation and inflection, this paper deals with the development of the nominalized infinitive with a focus on the development of the verb (i.e., from a simplex to compound structure) and its linkages to inflectional morphology or, more concretely, the integration of verbal categories (namely, tense and modality) into the NI pattern. It is shown that the development of verbal categories of the NIs follows a diachronic logic in which the category of tense and voice is integrated into the nominalized infinitives before modal verbs, which nicely parallels the results of the grammaticalization of the periphrases in the verbal domain. We also observe that epistemic modal verbs resist infinitive nominalization, which we attribute to the lack of non-finite forms of epistemic modal verbs coupled with the truth-presupposing character of nouniness.

1. POINT OF DEPARTURE AND AIM OF THE PAPER

Nominalized infinitives¹⁰¹ (NIs, such as (*das*) *Gehen* ‘walking’, (*das*) *Abschneiden* ‘cutting off’) are the most frequent deverbal nominalization patterns for abstract nouns in present-day German (PDG). Apart from

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some formal restrictions (cf. Blume 2004 for more details), the NIs are involved in different constructions in PDG, e.g. in light-verb constructions (such as *ins Rollen kommen* ‘to get going’) or in the progressive (such as *Sie ist am Arbeiten* ‘she is working’).

In PDG, the stems of infinitive nominalization come from simplex, prefix, and particle verbs and the NI does not have any morphological restrictions (1a). This is not the case for other nominalization patterns such as *-ung* nominals (1a’), which originally only accepted simplex verbs as bases but now also combine with prefix and particle verbs (for the diachronic details, see Demske 2000, Iordăchioaia & Werner 2019).

- (1a) *(das) (An-)chatten* ‘(the) chatting’
- (1a’) **Chattung*
- (1b) *(das) Freunde-Anchatten* ‘(the) chatting with friends’¹⁰²
- (1b’) *?Freunde-Anchattung*
- (1c) *(das) ständig-die-Freunde-Anchatten* ‘(the) constantly-chatting-with friends’
- (1c’) **Ständig-die-Freunde_{AKK}-Anchattung*
- (1d) *(das) Chatten der Freunde_{GEN}* ‘(the) chatting of friends’
- (1d’) **Chattung der Freunde*

While NIs can be formed from phrases containing a verb and arguments or modifiers (cf. 1b-d), this is not the case for *-ung*-nouns (cf. (1b’-c’)) although both patterns form abstract nouns in PDG. In addition, only the NI, but no *-ung*-nouns can nominalize verbal complexes which is shown in (2-5).¹⁰³

- (2a) *(das) Gegessen-Haben* lit. ‘(the) having eaten’, i.e., ‘the fact that one has eaten’
- (2a’) **Gegessen-Habung/-Haberei*
- (3a) *(das) Akzeptiert-Sein* ‘(the) being accepted’
- (3a’) **Akzeptiert-Seiung/-Seierei*
- (4a) *(das) Akzeptiert-Worden-Sein* lit. ‘(the) having been accepted’
- (4a’) **Akzeptiert-Worden-Seiung/Seierei*
- (5a) *(das) Schlafen-Müssen* lit. ‘the having-[to]-sleep’
- (5a’) **Schlafen-Müssung/Müsserei*

¹⁰² In this article, hyphens are used for multilexical NIs, which accords with the German punctuation convention. For earlier language stages, where such conventions did not exist, the examples are given according to their original form in the respective corpus.

¹⁰³ In some cases, one may find rare examples based on idioms such as *Handhabung* ‘handling’ (lit. hand-having) or, especially in philosophical jargon, based on loan translation such as *Bewusstwerdung* ‘consciousness raising’ (lit. conscious-becoming), which is presumably formed in analogy to the pre-existing *Bewusstsein* ‘consciousness’ (lit. ‘conscious-being’) from Latin *conscientia* (see Pfeifer et al. 1983, lemma *Bewusstsein*).

Here we see that NIs, but not *-ung*-nouns, can contain perfect, passive and modal auxiliaries. whereas *-ung* is restricted in PDG (more details in Iordăchioaia/Werner 2019), and other derivational affixes like *-erei* are similarly restricted (cf. **Gegessen-Haberei*, **Akzeptiert-Seierei*). The fact that NIs tolerate phrasal bases while true derivational affixes do not will be explained below with recourse to the assumption that NIs are formed by conversion (also “zero-derivation”).¹⁰⁴

NIs in Old and Middle High German were typically conversions from simplex verbs, while prefix and particle verbs followed later (Werner 2020). In this light, the current paper aims to answer the question of how the NIs developed the ability to nominalize verbal complexes or, in other words, to what extent inflectional categories can be integrated into nominals. It will be asked if a certain logic can be identified as to whether some verbal categories (e.g. tense) are nominalized before others (e.g. modality or mood). This is of special interest because research on grammaticalization has identified sequences in which verbal categories develop, e.g. that aspect develops before tense (see, e.g., Leiss 1992) and that verbal periphrases encoding tense developed from predicative constructions containing adjectives (see, e.g., Bybee et al. 1994: 61ff). However, in such a view, potential restrictions of such a conceivable development, i.e., whether some categories do not participate in integration into nominals, are not automatically excluded. Questions regarding the degree to which there is a logic behind the nominalization of verbal categories provide important answers regarding the architecture of verbal categories, of the potential and the limits of nominalizability, and of a better differentiation between derivation and inflection, since verbal categories are only allowed within the pattern of NIs, but not within that of derivation (see (2–5)).

The paper is structured as follows: section 2 investigates the diachronic development of the NI with regard to the question of whether an extension of the morphological structure of the underlying verb (e.g. from simplex to complex) of infinitive nominalization is attestable.

¹⁰⁴ One may object forms like the following: *diese Gegessen-Haben-Rumdiskutiererei* lit. ‘this having-eaten discussion’, i.e., ‘the discussion whether one has eaten s.th. or not’. However, a form like this possesses a compound structure in which the non-head (here *Gegessen-Haben*) acts more like a metalinguistic form. This can be seen by the fact that any other linguistic form could be placed here, such as, e.g., single lexemes (i) or whole sentences (ii), cf. (i) *„Ich“-Sagerei* lit. ‘“I“-saying’ or (ii) *Geht-nicht-mehr-Sagerei* lit. ‘(this) no-longer-works-telling’ (present-day German examples from corpus COSMAS II).

Section 3 focuses on the historical aspects of nominalizing verbal categories which are restricted in this type of nominalization. It will be shown that verbal complexes containing evidential modal verbs cannot be nominalized, while this is not the case for deontic modal verbs. All results are based on data from historical and synchronic corpora such as *Deutsches Text Archiv* on Early New High German (ENHG) and New High German (NHG), which serve as the basis for generalizations being contrasted with theoretical results from morphological theory and syntax in the history of German (see Werner 2020 for further methodological details).

2. MORPHOLOGICAL COMPLEXITY INCREASE

After a syncretism with the inherited *-inne/-anne-gerund* in Old High German (OHG) and the decline of the infinitive particle *zu* ‘to’ (Wilmanns 1906: 123), NI emerged in late OHG and became more common in Middle High German (MHG). For a detailed discussion, see Werner (2020). The nominalization of reflexive verbs in the 18th century follows after the nominalization of infinitives with argument structure, which emerged in the 16th century according to the DTA data. In the following, it will be shown that the nominalization of verbal complexes with auxiliaries (such as *(das) Gegessen-Haben* lit. ‘(the) having-eaten’) and modal verbs (such as *(das) Essen-Sollen* lit. (the) having-to-eat’) lies chronologically in between, namely in the 17th century. This raises the question of what was decisive for the nominalization of reflexive verbs and verbal complexes? Answering this question, it will first be shown that NIs were still underspecified with regard to the verbal categories tense, voice, and modality in the nominal domain. In this section, this aspect will first be linked to reflexive verbs and argument structure: it is argued that the nominalization of infinitives with argument structure created a pressure with respect to the reflexive verbs, which followed the verbs with arguments realized by pronouns as objects. Second, as regards the nominalization of verbal periphrases, it will be shown that the first examples of verbal complex nominalization were based on the auxiliary *sein*, which is underspecified with regard to encoding the resultative/perfect tense as well as the statal passive, and the passive auxiliary *werden*. Section 3 will deal with the development of nominalization of inflectional categories, i.e., verb clusters including semantic restrictions of PDG. It will be shown that epistemic modality and nouniness are incompatible for semantic-grammatical reasons.

Generally, the nominalization of simplex, prefix, and particle verbs begins in MHG and the nominalization of phrases starts in ENHG (Pavlov 2002: 242). According to Behaghel (1923: 357), this development begins in late MHG, although in some cases it is unclear whether we are dealing with nominalizations of VPs or compounds whose final elements are nominalized verbs and whose first elements are nouns that could be analysed as representing arguments of the verb. A rare example of such a possible nominalization from the 12th century from the MHG REM-corpus is given in (6).

- (6) *Biben* [,] *zan claffen*
 jitter-INF tooth/teeth chatter-INF
 ‘jittering, chattering of teeth’ [HvF, LvT, M541B-N, 904–914; author’s emphasis]

According to the corpus data, only nominalizations of the unmarked – or so to speak “present” – infinitive are attested until ENHG.

However, from ENHG some changes can be observed with regard to the possibility of compound nominalization, which is not documented before (beyond rare potential counter-examples like (6)): in MHG simplex, prefix, and particle verbs were nominalized. From early ENHG onwards, verbal phrases with argument structure are nominalized, which can be seen especially from deverbal compounds with an NI as head from the 17th century on, where these formations are attested regularly, cf. (7) from DTA:¹⁰⁵

- (7a) *das bluttgissen* ‘(the) blood pouring’ (1522)
 (7b) *das brotbrechen* ‘(the) bread breaking’ (1592)
 (7c) *Bludvergiessen* ‘(the) blood spilling’ (1602)
 (7d) *das Bierbrawen* ‘beer brewing’ (1603)

Compounds like those in (7) are diachronically prior to other nominalization constructions where internal arguments are realized (for synchrony, see Blume 2004, Bücking 2010). Put differently, Schlotthauer et al. (2014: 271) describe synthetic compounds with an internal argument as the minimal form of all phrasal compounds – which also holds true diachronically.

¹⁰⁵ In order to obtain better result quality, the query in DTA, which contained a definite article (*das*), was: “@das *en WITH \$p= NN.

From the 19th century, we find a wider range of such forms, for instance with pronominal (8a), idiomatized (8b) or adverbially modified (cf. 8c) non-heads (cf. DTA):

- (8a) *kein blosses Darandenken* lit. 'no mere there.about-thinking' '(someone's) not merely thinking about it' (1845)
- (8b) *das Zustandekommen* lit. 'the to.stand-coming', i.e., 'the coming-about' (1850)
- (8c) *das Zuhochhalten* (von etwas) lit. 'the too-high-holding', i.e., 'the holding (of something) too high' (1955)

From the 19th century we also find nominalizations of reflexive verbs. According to the literature, reflexive verbs could not be nominalized as NIs before MHG in the sense that the reflexive pronoun of a real reflexive verb (of the type *sich konzentrieren* 'to concentrate') as well as of unreal reflexive verbs (of the type *sich waschen* 'to wash oneself') remained covert in the NI in pre-MHG times (Behaghel 1923: 357). A reflection of this in PDG is seen in (9c), where a reflexive pronoun is not acceptable as the non-head of an NI (9b), although the related verb is obligatorily reflexive. According to our data, the pattern of nominalizing verbs with a reflexive pronoun developed in parallel for both, real reflexive and pseudo-reflexive verbs.

- (9a) *Die Kinder benehmen *(sich) gut.* 'The children behave themselves well.'
- (9b) **Das Sich-Benehmen der Kinder ist gut.* lit. '*The themselves-behaving of the children is good.' 'The behavior (lit. behaving) of the children is good.'
- (9c) *Das Benehmen der Kinder ist gut.* 'The behaviour (lit. behaving) of the children is good.'

Verbal NI nominalization with an overt realization of reflexive pronouns is not attested in the historical corpora of OHG (DDD) and MHG (REM). Reflexive pronouns belonging to pseudo-reflexive verbs (as in (10b)) are an argument without a lexical representation (Haider 2004: 86). For the nominalization of corresponding infinitives with reflexive pronouns of pseudo-reflexive verbs, this means that the ability to nominalize a pseudo-reflexive verb with a reflexive pronoun requires the ability to nominalize verbs with arguments, which became possible in ENHG. In MHG, a reflexive interpretation of an NI like that in (9c) had to be inferred. Since the reflexive pronoun has to be marked overtly in PDG, NIs from real reflexive verbs without an overt reflexive pronoun (such as *Verhalten* 'behavior') are considered lexicalized (as in (9c); Sandberg 1976: 59).

The need to mark reflexive or reciprocal pronouns overtly within an NI¹⁰⁶ is attested from early NHG onwards, cf. (10a–c) for pseudo-reflexives and (10d–f) for reflexive verbs (both from DTA, author's emphasis).

- (10a) *(das) Sichselbstbilden* 'the educating oneself' (1785)
- (10b) *(das)Sicherzählenlassen* lit. '(the) letting oneself be narrated' (1826)
- (10c) *(das)Sich-vorwärts-strecken des ganzen Menschen nach Einem Ziele* [...] lit. '(the) stretching-REFL forward of the whole man to one aim' (1875)
- (10d) [...] *ja das **Sichdummstellen** haben zu allen Zeiten, wie jetzt, Viele zu solcher Virtuosität gebracht, daß man irre wird, ob ihre täuschenden Darstellungen nicht wirklich natürlich sind* [...] (1838)
'yes, at all times, as now, playing dumb (lit. the oneself.dumb.put) has brought many to such virtuosity that it drives one mad trying to understand whether their deceptive representations are not really natural'
- (10e) *Man wird das **Sichübersichselbsterheben** der Seele nicht für einen fehlerhaften Zirkel halten können, [...]* (1900)
'One will not be able to regard the soul's self-exaltation (lit. the staying aloof of oneself from oneself) as a faulty circle, [...]
- (10f) *So ist z. B. **das Sichaussprechenkönnen** eines der mächtigsten Dämpfungsmittel der Affekte.* (1900)
'So, the being able to argue-REFL is one of the most powerful means of easing of the affects'

Apart from the steps towards increasingly complex NIs just described, NIs came to accept bases containing auxiliaries expressing tense, voice and modality. Since verbal categories can also be part of an NI in PDG, it is worth asking when these forms first occur and how they developed in the history of German.

3. THE DEVELOPMENT OF INFLECTIONAL CATEGORIES

Until ENHG, the so-called present infinitive in German was underspecified with respect not only to reflexivity but also to voice (cf. Paul 2007: 312). NIs like those in bold type in (11) had passive interpretations which are no longer possible.

- (11a) [...] *sô ist bezzern **schern** dann **schinden*** [Freid. 155, 20]
so is better shearing-INF than skinning-INF
'[...] so (the) shearing is better than becoming skinned'

¹⁰⁶ In some cases, some NIs are lexicalized in parallel and preserve an underspecified meaning, PDG *Benehmen* 'conduct, behaving' from the reflexive verb *sich benehmen* 'to behave' (Behaghel 1923: 357) instead of hypothetical *Sich-Benehmen* with the reflexive pronoun *sich*.

- (11b) *wer gesah ie hirt zewürken sô?* [Tristan V, Gandin episode 2795]
 who see-PF ever deer carving-INF this way-ADV
 ‘Who ever saw a deer being carved (lit. a deer carving) in this way?’

The NI of present-day German (PDG) is specified with regard to tense and modality (cf. *(das) Gegessen-Haben* lit. ‘(the) having-eaten’ or *(das) Besuchen-Müssen* ‘(the) having to visit’) as well as with regard to voice (such as *(das) Gefahren-Werden* ‘(the) being driven’). These verbal categories are considered to be derived from the so-called “present”, i.e., unmarked, infinitive (such as *Essen* ‘eating’, *Besuchen* ‘visiting’ or *Fahren* ‘driving’ respectively; Schlotthauer et al. 2014: 257). However historically, the “present” infinitive was not a form only for the present tense. Instead, it was unspecified with several temporal-passive meanings (Jolly 1873: 23). If tense, voice or modality had to be made explicit, a complementizing *dass* clause (such as *dass du gehen musst* ‘that you have to leave’) was preferred (Jolly 1873: 175). According to my own data analyses, only NIs of the present infinitive are documented from ENHG. More concretely, they are attested from the 17th century onwards. For the first time, nominalizations containing a predicative are nominalized with the copula verb *sein* ‘to be’ (as in (12)) and *werden* ‘to become, to get’. (as in (13); both examples from the DTA, author’s emphasis).

- (12a) *Di dise Schrift **däm stärblich-sein** ent-reisst [...]* (1645) ‘which wrests this screed from being mortal’
 (12b) *Daß Jch der Welt **ihr Gut-sein** oder Pochen Jns künfftige/ Dich liebend/ fromm und still/ Nicht achten wil.* (1652) ‘that I will be heedless of the well-being of the world or its knocking into the future / loving you / pious and silent’
 (13a) *wiewol **das garwerden** und abkühlen der Gläser* (1668) ‘albeit the becoming cooked [of s.th.] and cooling off of the glassware’
 (13b) *denn zerbricht es nicht eher/ so zertreibens die Saltze doch **im Kaltwerden** [...]* (1679) ‘because if it [a glass] is not broken sooner / so the salts will melt it while [it is] becoming cold’

Besides adjectives as in (12–13), also nouns (14a), present participles and compound adjectives (14b) are attested as nominalized predicative constructions (from DTA, author’s emphasis):

- (14a) *Du hast sie **durch dein heiliges Menschwerden/ Leiden und Sterben/ von Tod und Hölle** erlöset.*
 lit. ‘you have redeemed them from death and hell through your holy becoming human/ suffering and dying/.’ (1681)

- (14b) *so verfaulen auch die Citronen und alles Obst; d) das Stinkendwerden; e) das Ranzigwerden, [...] f) das Mürbewerden, so werden z. E. Seiden- und Wollenzeuge mürbe; g) das Wurmstichigwerden, so werden [...] Holz, Seiden- und Wollenwaaren, von den Würmern an- und aufgefressen*
 lit. 'so also the lemons and all fruit rot; d) the becoming stinking; e) the becoming rancid, [...] f) the becoming mushy, so e.g. silk and wool witnesses become mushy; g) the becoming vermiculated, so [...] wood, silk and wool goods are nibbled and eaten up' (1756)

Nominalizations from infinitives with perfect or passive auxiliaries are attested from the 19th century. The earliest-attested constructions of these types are nominalizations based on (adjectival) passives with *sein* 'to be', which have developed in parallel to the already existing nominalizations with *sein* + predicative. Examples are given in (15) (from DTA).

- (15a) *So ward das Wissen vom Handeln, das Gelehrtsein vom Leben geschieden.* 'so knowledge was separated from acting, learning (lit. being-scholarly) from life.' (1810)
 (15b) [...] *das Umdrängtsein und Eingeklemmtwerden von mächtigern Völkern*
 lit. 'the being crowded and becoming-jammed by powerful nations' (1810)
 (15c) *das Spätgeborensein des Johannes* lit. 'the being-born-late of John' (1835)
 (15d) *das Geschmolzensein des Inneren* lit. 'the being-melted of the interior' (1845)
 (15e) *das Mit-Strafebedroht-sein* lit. 'the by penalty-being-threatened' (1881)
 (16) shows NIs with the auxiliary *haben* 'to have', which are attested after data with the auxiliaries *sein* 'to be' and *werden* 'to become' (from DTA, emphasis by the author).
 (16a) *das frühere Nichtgekanthaben* lit. 'the former not-having-known' (1835)
 (16b) *das Bezahlt haben* lit. 'the having-paid' (1840)
 (16c) *Nur eigenes Selbstversuchthaben und Erproben geben ihm einen deutlichen und klaren Begriff von der einzelnen Bewegung und Übung* lit. 'only [a] personal having-tried and testing give him an unambiguous and clear notion of the particular movement and exercise' (1868)

Semantically, the homogenous uncountable semantics of the verbal infinitives with *sein* 'to be' (15) are preserved when the forms are nominalized. In a next step (approx. in the 18th/19th c.), nominalizations of the perfect infinitive (NI-perf) are attested (15). NIs with the copula verb *werden* 'to become' (cf. (14)) are nominalized in analogy to the copula *sein* 'to be' and the already existing NI-perf. These formations with more than one auxiliary did not appear in DTA before the 20th century, cf. (17).

- (17a) *das Sehendgewordensein* lit. 'the having become sighted' (1918)
 (17b) *das Fragwürdiggewordensein* lit. 'the having become dubious' (1935)
 (17c) *das Einsgewordensein* lit. 'the having become one [with s.o./s.th.]' (1944)

NIs with modal verbs are documented since the end of the 18th century. See here (18a–b) with *wollen* ‘to want, to be willing to’, (18c) with *sollen* ‘to be supposed to, to be about to’, (18d) with *dürfen* ‘may, to be allowed to’, (18e–g) with *müssen* ‘to must, to have to’. The causative verb *lassen* ‘to let’ is given in (19) (all examples from DTA). As can be seen from examples (15–19), these nominalizations are based on verb clusters. Some syntactic analyses treat the auxiliaries as ‘affixal verbs’ and the verb clusters as base-generated complex heads (see, e.g., Bierwisch 1990, Haider 2013: 16ff, 207ff, and, for criticism, Wurmbrand 2007: 278–283). In this view, affixal variants of auxiliaries can be described similarly to inflectional or derivational markers. This would fit the observation that auxiliaries of verbal clusters can cliticize to lexical verbs and may ultimately become affixes (cf. Lehmann 2015: 31ff; Vulgar Latin *cantare habeo* ‘I have sung’ > French *je chanterai*; ex. from Leiss 1998: 852) before new verbal clusters develop (such as French *je vais chanter*). In other words, analytic forms can change into synthetic structures, and these synthetic forms tend to be replaced later by new analytic forms (cf. Jespersen’s Cycle).

- (18a) *dem schändlichen Rechthabenwollen* lit. ‘the disgraceful being-right-will’,
i.e., ‘the disgraceful insistence on being right’ (1772)
- (18b) *das Reichwerdenwollen* lit. ‘the becoming-rich-will’, i.e.,
lit. ‘the willing to become rich’ (1789)
- (18c) *Sicherquickensollen durch Wein* lit. ‘being obliged to refreshing oneself by wine’
(1877)¹⁰⁷
- (18d) *das Nichtnennendürfen des Königs in den Berathungen* lit.
‘the non-must-mentioning the king in the deliberations’ (1840)
- (18e) *das Sterbenmüssen* lit. ‘the must-dying’ (1835)
- (18f) *das Wartenmüssen* lit. ‘the must-waiting’ (1855)
- (18g) *das Rotanstreichenmüssen* lit. ‘the must-painting red’,
i.e., ‘the circumstance that s.th. must be painted red’ (1950)
- (19) *das Spielenlassen gewisser Maschinen* lit. ‘the let-playing of certain machines’
(1800)

These historical examples with modal verbs like (18) and others from the historical corpora always involve deontic and never epistemic modals. We will now ask whether this constraint also holds in PDG, which would suggest that certain categories may resist nominalization.

¹⁰⁷ The alternative, reportative interpretation, namely ‘being said to refreshing oneself by wine’, will be discussed at the end of the paragraph.

To investigate this question, the Austrian Media Corpus AMC (version 3.1) was surveyed. It currently contains more than 10 billion current words with 40 million articles from 1990–2018 from all relevant Austrian print media (supported by Austrian press agency¹⁰⁸), i.e., from present-day Austrian Standard German.¹⁰⁹ As the generalizations received from the AMC data suggest, there is evidence for the fact that verbal complexes containing epistemic, but not deontic modal verbs resist infinitive nominalization in PDG, since the examples found in AMC only contain deontic modal (cf. (20–22)) or auxiliary verbs (cf. (23)).

- (20) *das Wartenmüssen vor der Tür* lit. ‘the must-waiting before the door’
- (21) *um das Lebenkönnen und Lebendürfen* lit. ‘on the can-living and may-living’
- (22) *Der Verkehr; die Grenze, das Haltenmüssen, das Verzollensollen, das alles habe der Gemeinde ökonomisch klarerweise gutgetan.* ‘The traffic, the border, the need to stop (lit. ‘the must-stopping’), the customs duties (lit. ‘the have-to-paying duty’) all this has clearly benefited the community economically.’
- (23) *die Angst vor dem Gefressenwerden* lit. ‘the fear of the being eaten’

Nominalizations containing epistemic modal verbs are not only absent from corpora, but are also judged to be unacceptable. The examples in (24–25) illustrate this with epistemic readings of *müssen* and *werden*.

- (24a) *Der Affe muss Äpfel geklaut haben.*
‘The monkey must have stolen apples.’
- (24b) **Das Äpfelgeklauthabenmüssen des Affen beschäftigte das Gericht.*
lit. *‘The court dealt with the apple-must-have-stolenness by the monkey.’
- (25a) *Sarah wird (gerade) schlafen (weil sie nicht ans Telefon geht).*
‘(Right now) Sarah must be sleeping (because she is not answering her phone).’
- (25b) **das (gerade) Schlafen-Werden von Sarah*
lit. ‘the must be sleeping (right now) of Sarah’

The question arises why epistemic modal verbs are subject to these restrictions. NI-perf can help to solve the puzzle: It denotes the fact that an event has taken place (Bücking 2015: 104f). In other words, NIs inherently presuppose truth: cf. *(the) winning* in the phrase *The winning surprised everyone* denotes the ‘fact that someone wins’. So, a modifica-

¹⁰⁸ Accessed internally via the Austrian Centre for Digital Humanities and Cultural Heritage on 2018/09/11.

¹⁰⁹ The query comprised all modal verbs of PDG (*müssen, dürfen, sollen, brauchen, mögen, können, werden, wollen*) used as part of nouns ending with *-en*, the inflectional morpheme of the infinitive.

tion of the denotation of a factual existence (the NI-perf) and of events (here in the form of the NI) is compatible with deontic modality (cf. (18a–g)) because deontic modality does not conflict with the being-a-fact semantics of the NI. By contrast, epistemic modality (24b), (25b) is incompatible with the truth-presupposing character of the NI because it encodes the sentence from the perspective of a truth-reducing speaker.¹¹⁰

As opposed to epistemic modality, reportative MVs are acceptable in NIs. See again (24a), here modified with reportative *sollen* ‘being said to’, cf. (26).

(26a) *Der Affe soll Äpfel geklaut haben.*

‘The monkey is said to have stolen apples.’

(26b) *das Äpfelgeklauthabensollen* lit. ‘the apple said-to-have stolenness’, i.e., ‘the rumour that s.o. has stolen apples’

Reportative modal verbs do not modify truth, but they signal the source of unreliable information to the hearer (evidentiality). This strengthens the view that only epistemic modal verbs are incompatible in nominals.

There is a longstanding debate on whether infinitives are nouns or verbs (see early, e.g., Jolly 1873, Schlotthauer et al. 2014, Werner 2020). Alternatively, it was argued that infinitives are underspecified with respect to a word class entry (see, e.g., Leiss 2003), while others (such as Bierwisch 2009, Iordăchioaia 2020) have argued that infinitives are both nouns and verbs. In the light of this discussion, one could argue that the non-existence of NIs with epistemic modal verbs is not a matter of nouniness, but, instead, our case is due to a lack of infinitival forms of epistemic verbs in general (see also Abraham 2001), i.e., a non-arbitrary gap in the paradigm of epistemic modal verbs.

4. CONCLUSION

The aim of this paper was to delineate the integration of inflectional categories (tense, modal verbs) into the morphological structure of the nominalized infinitive in the history of German including the explanation of potential restrictions in PDG. More concretely, what we can

¹¹⁰ Note that verbal complexes with epistemic modal verbs allow citations such as *Das “Äpfelgeklauthabenmüssen” klang für ihn komisch.* lit. ‘The “apple-must-have-stolenness” sounded strange to him’. This means a metalinguistic use of language. So, the restriction of epistemic modal verbs described above is not affected by this.

generalize from the historical corpus data of German is that NIs have gradually increased in complexity. From MHG, NIs whose verb contains a phrase (i.e., argument structure, phrases) occur in historical texts. This also affects the development of reflexivity (see section 2). Furthermore, the historical development of the NI has several links to inflection, which have not been described in the literature so far. It was shown that the marking of inflectional categories of the verb (tense, modality) within the NI is not arbitrary, but follows the principles of grammaticalization theory. More concretely, the nominalization of verbal complexes containing auxiliaries and copula verbs starts in early NHG with predicative constructions from the pattern *schön sein* ‘to be beautiful’ to the NI (*das*) *Schön-Sein* ‘(the) being beautiful’, which is in parallel to the development of the verbal domain. In a next step, the development widens in favor of NIs in the perfect tense, first with *sein* ‘to be’ (such as (*das*) *Erfreut-Sein* ‘(the) being-pleased’), and later with *haben* ‘to have’ (such as (*das*) *Besucht-Haben* lit. ‘(the) having visited’) and passive NIs (such as (*das*) *Besucht-Worden-Sein* lit. ‘(the) having been visited’). Finally, NIs with modal verbs are attested from the pattern (*das*) *Besuchen-Müssen* lit. ‘(the) having to visit’, which occurs in NHG for the first time. As regards the sequence of verbal categories involved, infinitive nominalization exactly follows the well-known principle of language change and grammaticalization research, namely that aspectual or temporal forms develop before modal forms. In other words, the development of verbal categories in the nominal domain reflects or follows the logic of grammaticalization of the verbal categories in the verbal domain.

As opposed to the parallels, there are also some differences between the nominal and verbal domain, namely that no verbal complexes with epistemic modal verbs can be nominalized whereas verbal complexes containing deontic verbs have been attested since the 19th century. Reportative modal verbs such as *sollen* behave like deontic modal verbs which can be seen via acceptability judgements due to a lack of empirical data (see section 3).

Semantically, the reason is that epistemic semantics is incompatible with the truth-presupposing concept of nouniness. This is an interesting field for further, especially cross-linguistic research, especially because previous research on finding a ‘core’ semantics for word classes failed not only from a cross-linguistic, but also from a language-individual perspective (see Helmbrecht 2005 for an overview). In this light, conversions of infinitives into nominals, if applicable in a language, are a promising research area for further investigation on nominal semantics

and the mechanisms of nominalization since they just take over and – in this regard – mirror the marking of inflectional categories of the verbal domain. Possible restrictions bear further implications for the division between derivation and inflection, since only conversions possess the ability to transform the originally prevalent categories of the source word class (here: verbal domain) into the target word class (here: nominal domain).

Summarizing the developmental logic towards a formal complexity increase that can be stated, the conversion of the verbal infinitive starts with the nominalization of unmarked or so-called “present”, i.e., underspecified verbal infinitives in late OHG and MHG, and moves to the nominalization of infinitival syntagmata and finally of infinitival verbal complexes. Although the underspecified NIs of late OHG and MHG were semantically complex in the sense that their individual meaning (such as a passive reading) had to be inferred from the context, the diachrony of the NIs shows that they became structurally more complex, allowing increasing amounts of structure both in terms of the morphological complexity of their base verbs (including argument structure) and in terms of their inflectional verbal categories (tense, mood) that they co-occurred with and that were integrated into the nominalization pattern. Even in PDG, verbal complexes with epistemic modal verbs resist infinitive nominalization. Nouniness as well as infiniteness syntactically presupposes truth, whereas epistemicity subjects truth to negotiation. This explains why NIs with epistemic but not with deontic modal verbs resist infinitive nominalization.

SOURCES

AMC = *Austrian Media Corpus*. Internal access via Austrian Centre for Digital Humanities and Cultural Heritage (ÖAW). URL: <https://www.oeaw.ac.at/acdh/tools/amc-austria-media-corpus> : [09/032020]

cosmas II = *Corpus COSMAS II*. Version 2.3.3. Ed. by Institut für deutsche Sprache Mannheim. Permanent URL: <https://cosmas2.ids-mannheim.de/cosmas2-web/faces/home.xhtml> [19/03/2020]

DDD = Deutsch Diachron Digital, URL: www.deutschdiachrondigital.de [2020/03/09]

DTA = Deutsches Text Archiv (1437–1927). URL: www.dwds.de [[2020/03/09]

REM = Referenzkorpus Mittelhochdeutsch. Ed. by the University of Bochum, Institute for Linguistics. URL: www.linguistics.rub.de/rem/ [2020/03/09]

REFERENCES

- Abraham, W. (2001): Modals: toward explaining the ‚epistemic non-finiteness gap‘. In: Reis, M. & Müller, R. (eds.): *Modalität und Modalverben im Deutschen*. *LB* 318, Sonderheft 09, Hamburg: Buske, 7–36.
- Behaghel, O. (1923): *Deutsche Syntax. Eine geschichtliche Darstellung*. Vol. I 1923. Heidelberg: Winter.
- Bierwisch, M. (2009): „Nominalization – lexical and syntactic aspects.“ In: Giannakidou, A. & Rathert, M. (eds.): *Quantification, Definiteness, and Nominalization*. Oxford: OUP, 281–320.
- Blume, K. (2004): *Nominalisierte Infinitive*. Tübingen: Niemeyer.
- Bücking, S. (2010): „Zur Interpretation adnominaler Genitive bei nominalisierten Infinitiven im Deutschen.“ *Zeitschrift für Sprachwissenschaft* 29 (2010), 39–77.
- Bücking, S. (2015): „Zur Bedeutung nominalisierter Perfekt-Infinitive im Deutschen.“ In: Fortmann, C. / Lübke, A. / Rapp, I. (eds.): *Situationsargumente im Nominalbereich*. Berlin: de Gruyter, 93–132.
- Bybee, J. / Perkins, R. & Pagliuca, W. (1994): *The Evolution of grammar: Tense, aspect, and modality in the languages of the world*. Chicago: The University of Chicago Press.
- Demske, U. (2000): Zur Geschichte der *-ung*-Nominalisierung im Deutschen. Ein Wandel morphologischer Produktivität. In: *Beiträge zur Geschichte der deutschen Sprache und Literatur* 122, 365–411.
- Haider, H. (2013): *Symmetry breaking in syntax*. Cambridge: Cambridge University Press.
- Haider, H. (2004): „Wie viel Syntax braucht die Semantik, und wie viel Semantik enthält die Syntax?“ *Tidsskrift for Sprogforskning* 2 (2), 71–90.
- Helmbrecht, J. (2005): Das Problem der Universalität der Nomen/Verb-Distinktion. ASSIDUE 16 (working papers of the Institute for Linguistics, University of Erfurt).
- Iordăchioaia, G. (2020): *D and N are Different Nominalizers*. *Glossa: A Journal of General Linguistics*, 5(1), 53. DOI: <http://doi.org/10.5334/gjgl.1111>
- Iordăchioaia, G. & Werner, M. (2019): Categorical shift via aspect and gender change in deverbal nouns. In: Heyvaert, L. / Cuyckens, H. / Hartmann, S. (eds.): *Special Issue on Categorical Shifts: from description to theory and back again*. *Language Sciences* 73, 62–76.
- Jolly, J. (1873): *Die Geschichte des Infinitivs im Indogermanischen*. München: Ackermann.
- Lehmann, C. (2015): *Thoughts on grammaticalization*. Third edition.
- Leiss, E. (1992): *Die Verbalkategorien des Deutschen*. Berlin & New York: de Gruyter
- Leiss, E. (1998): Ansätze zu einer Theorie des Sprachwandels auf morphologischer und syntaktischer Ebene. In: *HSK Morphologie / Morphology*, ed. by Besch, W. / Betten, A. / Reichmann, O. / Sonderegger, S (eds.). Berlin, New York: de Gruyter, 850–859.
- Leiss, E. (2003): „Die Wortart ‚Verb‘.“ In: *HSK Lexikologie*, ed. by Cruse, A. et al. Berlin, New York: de Gruyter, 605–616.
- Paul, H. (2007): *Mittelhochdeutsche Grammatik*. Revised by Th. Klein, H.-J. Solms, K.-P. Wegera. 25. ed. Tübingen (Sammlung kurzer Grammatiken germanischer Dialekte: A. Hauptreihe 2). Niemeyer: Tübingen.
- Pavlov, V. (2002): „Deverbale Nominalisierung im Frühneuhochdeutschen im Vergleich mit dem Neuhochdeutschen.“ In: Habermann, M. / Müller, P.O. / Munske, H. H. (eds.): *Historische Wortbildung des Deutschen*. Tübingen: Niemeyer. 227–244.

- Pfeifer, W. et al. (1993): Etymologisches Wörterbuch des Deutschen (1993), digitalized version, edited by Wolfgang Pfeifer in Digitalen Wörterbuch der deutschen Sprache, accessed via <<https://www.dwds.de/d/wb-etymwb>>, (06/21/2022)
- Sandberg, B. (1976): *Die neutrale -(e)n-Ableitung der deutschen Gegenwartssprache, zu dem Aspekt der Lexikalisierung bei den Verbalsubstantiven*. Goteborg: Acta Univ. Gothoburg.
- Schlotthauer, S. / Zifonun, G. & Cosma, R. (2014): „Verbale und nominale Infinitive – Strukturelle Eigenschaften und Funktion als Subjekt.“ In: Cosma, R. / Engelberg, S. / Schlotthauer, S. / Zifonun, G. (eds.): *Komplexe Argumentstrukturen. Kontrastive Untersuchungen zum Deutschen, Rumänischen und Englischen*. Berlin, Boston: de Gruyter, 253–282.
- Werner, M. (2020): Korpuslinguistische Perspektiven auf die sprachhistorische Entwicklung der nominalisierten Infinitive im Deutschen. *Linguistik online* 102,2/2020, 155–181.
- Wilmanns, W. (1906): *Deutsche Grammatik. Gotisch, Alt-, Mittel- und Neuhochdeutsch*. Vol. 3 Flexion. Strassburg: Trübner.
- Wurmbrand, S. (2007): How Complex Are Complex Predicates? *Syntax* 10/3, 243–288.