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Nominalization as Gradual Reification of Events: *-ion* Nominals between Event and Non-Event Readings*

Abstract: The polysemy and the argument-taking behaviour of deverbal nouns have been discussed controversially for a long time. While proponents of lexicalist models assume that deverbal nouns inherit the argument structure of their base verbs, representatives of syntax-based models subsumed under the label 'Neo-Construction Grammar' argue that the event and non-event readings of nominalizations are structurally determined. Drawing on a concept from Cognitive Linguistics, a proposal to be made in this article is that the oscillation of deverbal nouns between event and non-event readings depends on the degree of 'reification' of the underlying events, which can be represented on a bi-directional scale. Prototypical event readings assume the central position on this scale. In these readings, deverbal nouns follow their verbal bases not only with respect to argument realization, but also with respect to the omissibility of complements. The syntactic activation of inherited arguments and the compatibility of deverbal nouns with temporal and aspectual modifiers decreases towards the (leftmost) SUBSTANCE pole and the (rightmost) OBJECT pole of the Scale of Reification. The analyses concentrate on deverbal nouns displaying the suffix *-ion*.

Keywords: nominalization, deverbal nouns, *-ion* derivatives, argument inheritance, polysemy, reification, sequential scanning vs. summary scanning, metonymy

1. Introduction

Nominalizations have been a controversially discussed field of interest since Chomsky's (1970) 'Remarks on nominalization', which revealed significant contrasts in the behaviour of gerundive nominals (e.g. *John's refusing the offer*) and derived nominals (e.g. *John's refusal of the offer*). While gerundive nominals are formed productively, have meanings which are predictable from corresponding propositions (e.g. *John refused the offer*), and

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display the structure of sentences, derived nominals such as *refusal*, *construction*, *conversion*, or *residence* are formed less productively, tend to convey idiosyncratic readings, and display the internal structure of NPs. Given these contrasts, Chomsky argued against a transformationalist approach to word-formation and laid the foundation for the Lexicalist Hypothesis according to which gerundive nominals are formed syntactically, whereas derived nominals are products of the lexicon.

A highly influential work, which attempts to systematize the behaviour of nominalizations with respect to argument structure, is that of Grimshaw (1990). While authors such as Anderson (1983), Higginbotham (1983), or Dowty (1989) claimed that the syntactic realization of arguments is optional in the context of nouns, Grimshaw (1990: 45) argues that "[n]ouns can and do take obligatory arguments." Significantly, she distinguishes between three classes of nominals, namely complex event nominals, simple event nominals, and result nominals. The following examples, which were taken from Alexiadou & Grimshaw (2008: 2), illustrate this classification.

(1) a. The examination of the patients took a long time. (Complex)
b. The examination took a long time. (Simple)
c. The examination was on the table. (Result)

While complex event nominals – like verbs – have argument structures which have to be saturated, simple event nominals refer to events, too, but lack obligatory arguments. Result nominals denote the outcome of an event and behave syntactically like simplex nouns. Nevertheless, even result nominals imply the existence of *participants* (Grimshaw 1990: 54). Thus, for example, the examination on the table (cf. (1c)) is not entirely independent of the participants involved in the activity which led to the result.

Significantly, Grimshaw identifies a number of diagnostics that guide the classification of nominals[1]. These comprise *of*-phrases as indicators of object relations, *by*-phrases as indicators of subject relations, the status of possessive phrases as either subjects, objects, or non-arguments, agent-oriented adjectives (e.g. *intentional*, *deliberate*, *careful*, *thorough*), temporal modifiers (e.g. *constant*, *frequent*), aspectual modifiers (e.g. *for*/*in two hours*), determiners (e.g. *They observed the*/**an*/**one*/**that assignment of the problem*), and

[1] An overview of these criteria and related examples from Grimshaw (1990) is provided by Lieber (2016: 35).

purpose clauses (e.g. *The translation of the book* (*in order*) *to make it available to a wider readership*).

Despite valuable insights, Grimshaw's (1990) proposal is not without problems. In particular, her influential differentiation between argument-taking complex event nominals, apparently more flexible simple event nominals, and result nominals is blurred by the fact that nominals may belong to either class – a phenomenon which Grimshaw (1990: 47) attributes to a "fundamental and persistent ambiguity within the nominal system." For example, the sentences in (1) and those in (2) and (3) taken from Alexiadou & Grimshaw (2008: 2) and Grimshaw (1990: 53), respectively, show that deverbal nouns headed by the suffixes -(*at*)*ion* and -*ment* are polysemous in that they may assume an event or referential reading, depending on the context.[2]

(2) a. The frequent *payment* of your bills keeps your credit rating good.
    b. We demanded the *replacement* of the broken cups in no more than three days.

(3) a. The *expression* of her feelings.
    b. The *expression* (on her face)

Grimshaw's (1990) findings and data were resumed, discussed and revised in a number of subsequent works, including Roeper (1993), Alexiadou (2001), Borer (2003, 2013, 2014), Newmeyer (2009), Lieber (2016), and Olsen (2019). For example, corpus analyses performed by Lieber (2016) reveal the full range of polysemy displayed by nominalizations and nominalizing suffixes. Moreover, they suggest that the realization of argument structure is not restricted to nominals with complex event readings, that event readings are also possible if arguments are omitted, and that converted as well as simplex nouns can contextually display eventive readings. Significantly, a neat classification of nominals is problematic not only for Grimshaw's (1990) 'event model', but also for 'structural models' like those proposed by Alexiadou (2001) or Borer (2003, 2013, 2014). As pointed out by Alexiadou & Grimshaw (2008), both frameworks make very similar observations as to the argument-taking behaviour of nominalizations, and both frameworks are eventually faced with the same questions.

[2] Throughout this article, nominalizations are represented in italics in the examples.

A fundamental difference between 'event models' and 'structural models' lies in the way deverbal nouns derive their argument structure. Advocates of structural models reject the view that these nouns inherit the argument structure of their verbal bases, as assumed for example by Olsen (1986, 2019, 2020), Randall (1988), Bierwisch (1990–1991, 2015), Baeskow (2002), or Jackendoff (2021). In structural models, which comprise Borer's (e.g. 2003, 2013, 2014) exo-skeletal model and Distributed Morphology (e.g. Marantz 1997; Harley & Noyer 2000; Embick & Marantz 2008; Embick 2021), argument structure is exclusively determined by the syntactic configurations in which category-neutral roots are inserted. However, the latter models tend to overlook that the behaviour of deverbal nouns with respect to argument realization in their event readings is not independent of the base verbs' predisposition to either realize or omit their arguments. An important correlation which Grimshaw (1990: 47, 49) herself only mentions in passing and which has been neglected in subsequent literature is that "[s]ome [nouns] are systematically like verbs in their argument-taking capacities" (1990: 47) and that the obligatoriness of argument realization has to be interpreted relative to the argument-selection behaviour of the base verbs. This correlation is relevant especially for non-subject arguments (i.e. for complements), which are optional for some verbs, but not for others. If deverbal nouns systematically reflected their base verbs' behaviour with respect to argument realization and 'null instantiation' (in the sense of Fillmore's Frame Semantics, e.g. Fillmore & Baker 2009: 328–329) in their event readings, this correlation would be a strong indicator of inheritance.

As far as nominalization is concerned, it is interesting to observe that derivatives which superficially look like Simple Event Nominals in the sense of Grimshaw (1990), i.e. like deverbal nouns lacking argument structure, often leave their complement locally unexpressed and create an anaphoric relation between this 'definitely null-instantiated' argument and a referent in the preceding discourse context.[3] If the argument-selection behaviour of nominals is analysed independently of the larger discourse context, relations of co-reference, which may extend beyond the sentence boundary, are likely to go unnoticed. As a result, the nominalization appears to be more flexible although the

[3] 'Locally unexpressed' is intended to mean that the complement of the deverbal noun is neither realized in the form of an *of*-PP (e.g. *the construction <u>of the cathedral</u>*) nor in the form of an Obj-poss NP (e.g. *<u>the cathedral's</u> construction*).

inherited complement is actually realized in a non-canonical position. While the question of argument realization and omission mainly arises in the context of event readings, it is a well-known fact that "relics" of argument structure also surface in other contexts. For example, as pointed out by Olsen (2020: 72), the realization of the internal, but not of the external argument of the base verb is possible if the deverbal noun conveys a 'Result State' reading, e.g. *The pollution of the lake* (**by the factory*) *posed a danger to the community*. Moreover, as far as referential readings are concerned, approaches which dispense with argument inheritance would have to explain how roles such as Agent (e.g. *administration*), Patient (e.g. *delegation*), or Result (e.g. *translation*) are identifiable for the respective referents because these roles have to be defined relative to some event denoted by the base verb.

The aim of this article is neither to review the rich body of literature on nominalization nor to evaluate opposing schools of thought. Instead, it will be proposed that the ambiguity of deverbal nouns between prototypical event readings (in which they closely follow their base verbs) and less central readings (including referential readings) is not due to "a fundamental and persistent ambiguity within the nominal system" (Grimshaw 1990: 47), but rooted in their status as 'reified' situations. From a cognitive point of view (e.g. Langacker 1987a, 1987b; Brinton 1995, Radden & Dirven 2007), verbs and their derived nominals refer to the same situations, but these situations are 'reified' and hence 'thing-like' in the case of deverbal nouns. According to Langacker (1987a) and Radden & Dirven (2007), there are two different modes of construing a complex scene, namely 'sequential scanning' and 'summary scanning'. While the component states or phases of a situation are processed sequentially when referred to by a tensed verb, they are condensed into an atemporal abstract whole or gestalt in the course of the nominalization process. Nevertheless, the internal structure of reified situations can be reactivated by expressions encoding temporal relations (e.g. temporal modifiers like *take X time* or aspectual verbs such as *begin* or *stop*) to yield event readings.[4] Proceeding from Radden & Dirven's (2007) observation that events are reified as either objects or substances and hence coded as either count nouns or mass nouns, it will be argued that reification is a gradient phenomenon

[4] The phrase *take x time* is intended to mean "to take a certain amount of time", e.g. *The construction of the protein took eight months*. ('eight months' = *x time*).

which can be represented on a bidirectional scale. While the much-discussed complex event readings, which constitute the prototypical readings, occupy a medium position on the Scale of Reification, other, less central readings tend towards the SUBSTANCE pole or the OBJECT pole. Moreover, while deverbal nouns follow their base verbs with respect to argument realization (and omission) in their prototypical event readings, their verb-like behaviour – especially their disposition for temporal anchoring – decreases towards the SUBSTANCE and OBJECT pole, respectively. Thus, a contextual reactivation of the internal composition of the events denoted by the base verbs works best for those readings of the derivatives which are neither too abstract nor too concrete and hence occupy a medium position on the Scale of Reification.

The article is structured as follows. In section 2, the bidirectional scale which represents reification as a gradient process will be introduced, and it will be shown that the meanings of a deverbal noun can be distributed over different positions on this scale – depending on the context. Section 3 is concerned with event and non-event readings of *-ion* nominals. In Section 3.1, arguments in favour of argument inheritance are provided. Sections 3.1.1 and 3.1.2 present the results of two small-scale case studies which compare the behaviour of the inherently transitive verbs *examine* and *construct* and the corresponding nominalizations *examination* and *construction* in their event readings with respect to complement omission. In section 3.1.3, six additional verb-noun pairs, three of which do not allow for complement omission (*install*/*installation*, *implement*/*implementation*, *evaluate*/*evaluation*), while the other three do (*translate*/*translation*, *discuss*/*discussion*, *explore*/*exploration*), are discussed in a more general way. This discussion is intended to further support the claim that derived nominals behave like their base verbs with respect to argument realization and null instantiation in their prototypical event readings. Following Fillmore (1986) and subsequent work, four types of null instantiation will be distinguished, namely definite, indefinite, generic, and constructional, the latter of which is irrelevant for the purpose of this study. The contrastive analyses of the verbs and their derivatives will show that the derivatives follow their verbal bases with respect to the realization of the internal argument in their prototypical event readings and that derivatives which superficially look like Simple Event Nominals (Grimshaw 1990) may display Definite Null Instantiation. Thus, a referent for the locally unexpressed

complement is retrievable from the discourse context. Section 3.2 deals with the reification of events along the Scale of Reification towards the SUBSTANCE or the OBJECT pole and the correlating (in)compatibility of the nominalizations with event markers. The article ends with a summary and an outlook which attempts to integrate the findings on *-ion* derivatives into the overall picture of English nominalization (section 4).

In the current text, only a limited number of representative sentences or contexts is provided for reasons of space. Additional data are provided in three appendices. Appendix 1 displays a sample of sentences which show that referents for the complements of *examination* and *construction*, which are derived from strictly transitive verbs, must be retrievable from the discourse context if the complements are not specified in the form of the canonical *of*-PP or an Obj-poss phrase. The appendix also lists referential readings of the two nominalizations. Appendix 2 contains sentences which show that *installation*, *implementation*, and *evaluation* (like *examination* and *construction*) require the availability of a referent for a locally unexpressed complement, whereas *translation*, *discussion*, and *exploration*, which are derived from optionally transitive verbs, allow for Indefinite Null Instantiation. Appendix 3 provides samples of less central readings attested for deverbal *-ion* derivatives beyond those discussed in section 3.1, including a variety of referential readings. In less central readings, the realization of the inherited arguments only occurs sporadically or remains fragmentary.

Unless specified otherwise, the examples were taken from the Concretely Annotated English Gigaword (henceforth abbreviated as Gigaword), the English Web 2021 (enTenTen21) provided by Sketch Engine, and the *Oxford English Dictionary* (OED). The Gigaword corpus is annotated in the Penn Treebank style and contains 4.5 billion words from 10 million English newswire articles, from 1994 to 2010. A significant advantage of Gigaword is that it allows users to search for syntactic structures by means of the software tool Tgrep2. For example, the search string '-tw "S < (NP < (/N/ < /examination/)) !< (PP < (IN < /of/))"' yields sentences in which an *-ion* derivative occurs without a PP-complement. In a next step, the contexts in which these sentences occur have to be manually searched for the presence or absence of non-locally expressed complements. While corpus-based analyses have been performed for *-ment* suffixation (Kawaletz & Plag 2015), *-ing* nominalizations (Andreou & Lieber 2020, Lieber & Plag 2022), and deverbal conversion

nouns (e.g. Andreou & Lieber 2020, Iordăchioaia 2020, Iordăchioaia, Schweitzer, Svyryda & Buitrago Cabrera 2020), this study presents fine-grained analyses of *-ion* derivatives which are primarily based on a large, syntactically parsed corpus and which also take the (wider) discourse context into consideration. A further innovation is a systematic contrastive analysis of selected *-ion* nominalizations and their base verbs with respect to different types of null instantiation.

In view of the very high frequency of occurrence of *-ion* nominalizations in newswire articles and the polysemy of these derivatives, it is important to point out that the findings presented in this article are based on qualitative rather than quantitative corpus analyses. The data extracted for this article will also be made available on the Zenodo repository operated by CERN.

2. Nominalizations as Reified Situations

In Cognitive Linguistics (e.g. Langacker 1987a, 1987b; Radden & Dirven 2007), two modes of cognitive processing which serve to structure complex scenes have been identified, namely 'sequential scanning' and 'summary scanning'.[5] According to Radden & Dirven (2007: 346f), sequential scanning is a mode of viewing a situation in its successive phases, whereas summary scanning is a mode of viewing a situation in which all its phases are activated simultaneously, so that the situation is seen as timeless. While Langacker (1987a: 248) makes this difference in construal more tangible by comparing 'sequential scanning' with watching a motion picture and 'summary scanning' with viewing a photograph, Dewell (2015: 20) compares the latter mode, which he – following Talmy (2000: 70–72) – refers to as 'synoptic construal', with the bird-eye's view. Since the focus of attention is directed from a distance at the setting as a whole and on what is going on in this setting, this perspective is more holistic than the sequential construal. Although in principle, both perspectival modes are available for structuring a complex scene, Langacker (1987a: 248f) and Radden & Dirven (2007: 79f) observe that nominalizations as atemporal 'reifications'

[5] In his excellent works on German prefix verbs, Dewell (2011, 2015) shows that verbs with separable prefixes (e.g. *durchregnen* "rain through", *herumgehen* "go around", *umrühren* "stir") prompt a sequential construal, whereas verbs displaying inseparable prefixes (e.g. *bedachen* "roof", *entkleiden* "undress", *erröten* "blush") prompt a synoptic construal, the latter of which corresponds with Langacker's summary scanning.

of temporal situations prompt a summary construal. For example, while the component states or phases encoded by the verb *enter* are processed sequentially (i.e. in series), they are activated simultaneously in the construal of the scene denoted by the nominalization *entrance*. Thus, the same component states that underlie the verb and the nominalization are profiled collectively as a thing if they are activated by means of summary scanning. The following representation adapted from Langacker (1987b: 90) illustrates the two modes of construal. While the verb and its nominalization refer to the same situation and relations involved, the phases of the situation are processed serially only in (a), as indicated by the heavy-line portion of the time arrow. The schema in (b) represents the summary view of the situation for which temporal progression is irrelevant and which profiles the relations collectively, as indicated by the highlighted contour of the ellipse.

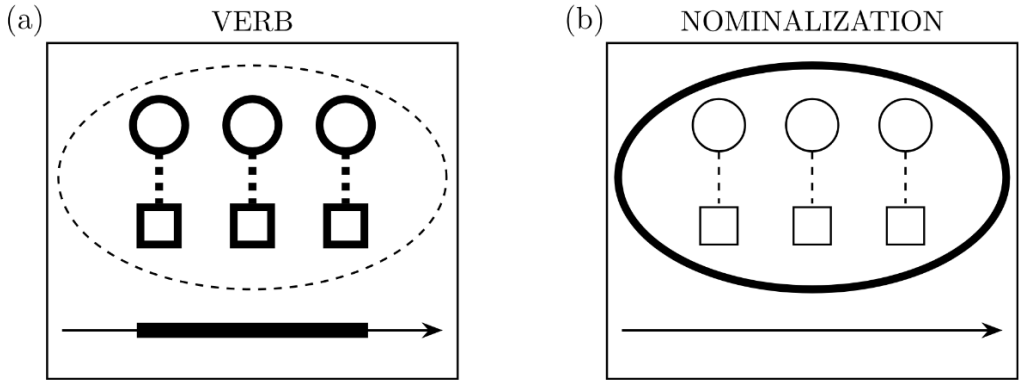

Fig. 1: Sequential scanning (a) and summary scanning (b)

The conceptual shift from situations to things, which is referred to as 'reification' (Langacker 1987b: 90; Brinton 1995: 29; Radden & Dirven 2007: 79–80), accounts for the interpretation of nominalizations as count or mass nouns and for their compatibility (or incompatibility) with determiners, adjectives, and quantifiers. However, since the internal structure of the reified situations denoted by nominalizations is not lost, but merely backgrounded (i.e. they may have a beginning, a duration, and an endpoint), the nominalizations allow for temporal or aspectual modification in their canonical event readings, as the following sentences show.

(4) a. His *entrance* through the grand foyer took a full minute. (Langacker 1987a: 246f)

b. Our *marriage* has lasted for sixty years. (Radden & Dirven 2007: 80)

c. The *construction* of the building in the years 1464 to 1478 is due to the success of the Lübeck merchants. (enTenTen21)

Radden & Dirven (2007: 81–83), who are concerned with abstract nouns in general (including simplex nouns like *war*, *crime*, or *peace*), identify two routes of reification which are metaphorically described as 'reification as object' and 'reification as substance'. While episodic situations or relations (e.g. *instruction*, *marriage*), which are bounded in time, internally heterogeneous, and possibly reoccurring, are reified as objects and coded as count nouns, steady situations or relations (e.g. *information*, *knowledge*), which are temporally unbounded and hence of indefinite duration, are reified as substances and coded as mass nouns. The underlying ontological metaphors which motivate these routes of reification are EPISODIC EVENTS ARE OBJECTS and STEADY EVENTS ARE SUBSTANCES, respectively. While the classification of simplex abstract nouns proposed by Radden & Dirven is not immediately relevant for the *-ion* derivatives discussed in the present article (but cf. section 4), an important point made by these authors is that there are abstract concepts which may be reified as either objects or substances (e.g. those denoted by *crime* or *war*). As far as concrete nouns are concerned, a similar ambiguity is observable. For example, according to Radden & Dirven (2007: 71–74), a noun like *beer*, which is a mass noun and typically denotes a substance, can be reinterpreted as an object (e.g. *Can I have another beer*?). Likewise, a noun like *car*, which typically denotes a concrete object, can be reinterpreted as a substance (*You will get a lot of car for your money*). Thus, *beer* and *car* have the status of hybrid nouns "along the object-substance continuum" (2007: 83).

Similar cases are discussed by Brinton (1995: 32), who uses the established terms "packaging" (or "bounding") and "grinding" (or "debounding") for the shift from mass to count and from count to mass, respectively. While Brinton, too, defines reification, which coincides with the morphological process of nominalization, as a cognitive process "in which a verbal situation is conceptualized as an object or mass" (1995: 29), she reveals that there is an intermediate stage. First, reconsider the noun *beer*, which typically constitutes a mass noun. If *beer* surfaces as a count noun, it conveys meanings like 'serving of', 'kind(s) of', or 'portion of' (e.g. *I would like another beer*). However, a sentence like *Please wipe up the beer on the counter* shows that there is something in between because the phrase *the*

beer on the counter denotes "a vague quantity of beer". Although *beer* remains a mass noun, the amount of beer referred to is bounded to some degree, i.e. it is neither an unbounded mass nor a portion or specific type. Transferred to nominalization, this boundedness of "indeterminate limits" (Brinton 1995: 38, quoting Allen (1966: 205f)) also accounts for the phenomenon that nouns formed from activity verbs like *explore* or *pursuit* surface as mass nouns even if the activities appear to be temporally bounded, as shown in (5).

(5) a. His exploring of the cave took place this morning (*and is still taking place).

b. The police officer's pursuit of the criminal went on for a long time (*and is still going on).

Although Brinton does not make reference to the two modes of construal introduced above, i.e. sequential and summary scanning, these examples show that the temporal structure of the reified events is still accessible and available for reactivation. At the same time, the blocking of further temporal modification (i.e. **and is still taking place* in (5a) and **and is still going on* (in (5b)) shows that a full return to sequential scanning as prompted by the base verbs *explore* and *pursue* is avoided.

Given the fact that deverbal nouns may be reified as either more 'thing-like' or more 'substance-like', the proposal to be made here is that reification is a gradient phenomenon which as such can be represented on a bidirectional scale. This 'Scale of Reification' extends from prototypical event readings to 'substance-like' readings (left-hand side of the scale) and 'object-like' readings (right-hand side of the scale), as shown in Figure 2.

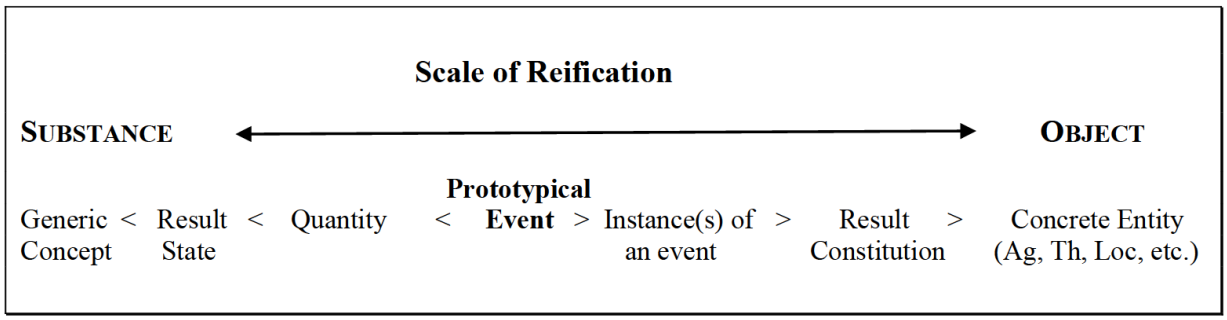

Fig. 2: Scale of Reification

While prototypical event readings occupy a medium position on the Scale of Reification, the other readings tend towards or coincide with the SUBSTANCE pole or the OBJECT pole. It is only in the prototypical event reading that deverbal nouns follow their base verbs with respect to the realization or omission of arguments – as anticipated by Grimshaw (1990).

Significantly, it should be pointed out that none of the two poles is more (or less) reified than the other one and that none of the poles is more 'verb-like' (or 'noun-like') than the other one. Instead, both the SUBSTANCE and the OBJECT pole are located in the nominal domain where they represent opposing conceptualizations of the nominalized events (i.e. the highest possible degree of abstraction vs. the highest possible degree of concreteness).[6] Thus, the prototypical event reading of a deverbal noun, which – as compared to the sequential event reading directly encoded by the underlying verb – is reified to a moderate degree and hence accessible by summary scanning, is simultaneously in opposition with the highly abstract 'Generic-Concept' reading on the left and the 'Concrete-Entity' reading on the right. Note that this dual opposition would be missed if the potential readings of the *-ion* nominals were represented as a continuum from 'verbiness' to 'nouniness' on a unidirectional scale because such a scale would not capture the intermediate readings, which – due to their properties described in section 3.2 – either tend towards the SUBSTANCE pole or towards the OBJECT pole.

Since verbs and deverbal nouns realize their arguments in different ways, it is assumed here with Bierwisch (1990–1991, 2015), Olsen (2020), and Jackendoff (2021) that inheritance is semantically determined. As pointed out by Jackendoff (2021: 143), "[n]ouns that are morphologically related to verbs typically inherit the verb's semantic argument structure, whether expressed syntactically or not. For instance, the *construction of a building* semantically implies both an entity doing the constructing and an entity being constructed; a *donation* is something that one entity is donating to another." Moreover, although there may be "relics" of argument structure in the 'substance-like' and 'object-like' readings, the possibility of temporal anchoring decreases towards the SUBSTANCE and OBJECT pole. Examples of *-ion* nominalizations whose readings match the positions of the Scale of Reification (from left to right) are provided in (6). All the sentences were taken from Gigaword.

(6) a. She studied *composition* at New York University, absorbed jazz and gospel into her style, later wrote an opera for the Munich Biennale and also worked as musical director for "The Wiz" on Broadway. **('Generic Concept')**

[6] As mentioned above, the SUBSTANCE-OBJECT metaphor also applies to simple nouns like *car* or *beer* if they are reinterpreted as mass or count nouns, respectively, and in this case, there is no verbal information involved at all.

b. But they said the prison term is not enough to undo the *financial devastation* he brought. **('Result State')**

c. *All construction* stopped for six weeks, and before it resumed, the workers were sent to a 40-hour training program on handling hazardous materials. **('Quantity')**

d. The *discussion* of the proposal occurred via computer, according to e-mail messages obtained by The Arizona Republic. **('Prototypical Event')**

e. Repeated *examinations* did not confirm that. **('Instances of an event')**

f. "To put it plainly, the *construction* was shoddy," Bentley said. **('Result Constitution')**

g. A Polaroid photo is a unique, spontaneous *creation*, blurred lines and all. **('Concrete Entity/Product')**

The continuum proposed in Figure 2 is intended to systematize the behaviour of *-ion* nominals (as representatives of deverbal nouns) with respect to argument realization, quantification and aspect. If considered in isolation, sentences like those in (6) might convey the impression that nominalizations are largely independent of the semantics of their base verbs and hence formed syntactically. However, given the summary view, which renders the underlying events more 'thing-like' (or 'substance-like'), the extent to which the nominalizations follow or deviate from their verbal input is basically determined by their degree of reification, which renders them more or less compatible with event markers.

Significantly, there is no one-to-one relation between a deverbal noun and a position on the scale. Although there are tendencies (for example, deverbal nouns derived from activity or state verbs are less likely to display 'Result' readings than those derived from accomplishment verbs), the readings of a deverbal noun may be distributed over two or more positions of the Scale of Reification – depending on the context. This is exemplified for *construction* in (7).

(7) a. He said he had distanced himself from decisions about the *construction* of the home by the university's foundation […]. **('Prototypical Event')**

b. The Massachusetts Port Authority said Thursday that it had suspended all *construction* at the airport. **('Quantity')**

c. But the Empire State's *construction* was far denser. **('Result Constitution')**

d. The new *construction* is close to the Olympic stadium, and the investors are betting that real estate prices will rise before the Games in 2012. **('Concrete Entity')**

Moreover, the accessibility of the internal temporal structure of the deverbal nouns and their inherited arguments decreases towards the SUBSTANCE and OBJECT pole of the scale, respectively. Thus, a contextual reactivation of these components works best for those readings of the derivatives which are neither too abstract nor too concrete and hence occupy a medium position on the Scale of Reification. As far as less central readings are concerned, other contextually salient facets can be highlighted, such as a quantity (7b), an entity's constitution (7c), or the product of the event denoted by the base verb (7d). In the following sections, the accessibility of the internal structure of the underlying events is discussed in more detail for event readings (section 3.1) and for readings that tend towards the SUBSTANCE pole and the OBJECT pole, respectively (section 3.2). Again, the focus is on deverbal nouns displaying *-ion* suffixation.

3. Deverbal *-ion* Derivatives between Event and Non-Event Readings

In section 1, it was pointed out that similarities between verbs and their derived nouns with respect to argument selection are indicators of argument inheritance. As mentioned but not further pursued by Grimshaw (1990: 49) and beyond, shared behaviour is reflected not only by the presence of arguments (especially non-subject arguments), but also by the verb's and the derived noun's predisposition to omit their complement. If the argument structure of deverbal nouns was determined syntactically and hence independently of their base verbs, as assumed for example by Borer (2014), the obligatoriness or optionality of argument realization would be arbitrary. Moreover, the statement "[c]omplements, if missing, certainly indicate an R-nominal" made by Borer (2013: 57, footnote 9) conceals that complements of deverbal nouns – like complements of transitive verbs – are often realized in non-canonical positions. Derivatives which superficially look like Simple Event Nominals, i.e. like deverbal nouns lacking argument structure, often display Definite Null Instantiation in the sense of Fillmore (1986). In this case, the internal argument inherited from the base verb is neither realized in the form of an *of*-PP nor as an Obj-poss phrase. Instead, it is implied as a null argument for which an antecedent must be retrievable from the preceding discourse context (e.g. *Kano was known as a REMOTE site and installation began in 1960*). If the argument-selection behaviour of nominals is analysed independently

of the wider discourse context, anaphoric relations of this kind, which may extend beyond the sentence boundary, are likely to go unnoticed. As a result, the nominalization appears to be more flexible than the verb from which it is derived although the inherited complement is actually realized in a non-canonical position. In the following section, exemplary *-ion* derivatives displaying event readings will be compared to their verbal bases with respect to complement omission.

3.1 Event Readings

As outlined in section 2, an effect of reification is that the event denoted by a verb is not processed as it unfolds in time, but viewed as an abstract, atemporal whole or gestalt. This mode of processing an event or complex scene is referred to as summary scanning in Cognitive Linguistics. Significantly, the participants and their relations to the event are merely backgrounded and available for contextual reactivation. Likewise, the internal temporal structure of the reified event remains accessible, as the following quotation from Radden & Dirven (2007: 79) shows.

> The conceptual impact of reification is in giving relational concepts the kind of stable existence that we typically associate with things. […] At the same time, however, reified things preserve some aspects of their relational, and often processual character: they may have a beginning, a duration and an end, which can be brought out by means of temporal expressions. Thus, we can speak of a marriage or friendship which began in 1955, lasted for fifty years, and ended in 2005, but we cannot speak of a friend, a wife or a tree that began in 1955 or lasted for fifty years.

Consider for example the verb *construct*, which is classifiable as an accomplishment verb because any situation it denotes has a certain duration and is directed towards an inherent or intended endpoint.[7] While a sentence like *They constructed a protein that could act as a blueprint for its own replication* indicates that the activity denoted by the tensed verb *construct* is completed, a phrase like *the construction of a protein that could act as a blueprint for its own replication* 'summarizes' the same complex scene, with the result that the individual phases are backgrounded. In other words, we do not track the Agent as he or she acts upon the Patient and the Patient's change of state relative to the Agent's activity, but rather form an abstraction

[7] Since the inherent or intended endpoint of the situation denoted by a telic verb is not necessarily reached, Depraetere (1995) stresses the necessity to differentiate between (a)telicity and temporal (un)boundedness. See also Andreou & Lieber (2020) on this point.

(or snapshot) of the scene for which the unfolding of the individual stages in time is irrelevant. Nevertheless, this summary or snapshot of the situation remains dynamic because the relations holding between participants as well as temporal relations are merely backgrounded and hence available for contextual reactivation, e.g. *The construction of the protein took eight months*. Elements which provide access to these components are for example temporal modifiers (e.g. *frequent*), aspectual modifiers (*take X time*, *in/for X time*), or agent-oriented adjectives such as *intentional*, which, like rationale clauses, signal an Agent's control of the event. In sum, these are the elements which have been identified as diagnostics of event readings in the literature (e.g. Grimshaw 1990, Mauner & Koenig & 2000, Lieber 2016, Borer 2013). As illustrated in Figure 2, prototypical event readings of deverbal nouns are most 'verb-like' and hence occupy a medium position on the Scale of Reification. Moreover, while 'relics' of the argument structure of the base verbs also surface in non-event readings (cf. section 3.2), nominals derived by means of the suffix *-ion* tend to follow their base verbs with respect to the realization of the inherited arguments in their event readings. Thus, the alleged flexibility of nominalizations with respect to argument structure seems to be systematic rather than arbitrary. As indicted in section 1, this postulate comprises not only the realization, but also the omissibility of arguments – especially of the complement.

As far as verbs are concerned, four types of argument omission or null instantiation have been distinguished in works dealing with implicit arguments (e.g. Fillmore 1986; Condoravdi & Gawron 1996; Lambrecht & Lemoine 2005; Ruppenhofer & Michaelis 2010; Boas 2017; Baeskow 2025a, 2025b), namely indefinite (INI), definite (DNI), generic (GNI), and constructional (CNI). Examples from Gigaword (8a, c), the OED (8b), and Ruppenhofer & Michaelis (2010) (8d) are provided below.

(8) a. Butter seems to be cheaper in November than in December, when more people *bake*. (INI)
b. That sofa-table in the window. When would you be able to *deliver*? (DNI)
c. China *produces* and we *consume*. (GNI)
d. Phil's Cherry Pie: *cool* Ø briefly, then *eat* Ø warm. (CNI)

Since the omitted argument of *bake* is conceptually implied (or existentially bound) in (8a), we are dealing here with Indefinite Null Instantiation (INI). The default interpretation of indefinitely null-instantiated arguments is guided by world knowledge as represented in

Frames (e.g. Fillmore & Baker 2009) and knowledge regarding the verb's selectional preferences (e.g. Rice 1988, Jackendoff 1990, Resnik 1993, Baeskow 2025a). As far as the verb *deliver* in (8b) is concerned, an appropriate interpretation of the null argument is possible only if an antecedent, i.e. a referent which binds this argument, is retrievable from the preceding context. Put differently, the implicit argument receives a definite interpretation if it refers to 'given' information. Example (8c) shows that contextually unexpressed arguments may also assume a generic interpretation. As pointed out by Goldberg (2001: 518), the activities referred to in generic contexts are often characteristic of the subject arguments. Constructional Null Instantiation (CNI) is at issue if the implicit argument is structurally licensed. Typical examples of CNI are passive sentences, or genre-based omissions discussed by Ruppenhofer & Michaelis (2010), which manifest themselves for example in instructional imperatives (cf. (8d)) or match reports (*Paramatti put the ball back into the box and Panadic headed ∅ into the net*). According to Ruppenhofer et al. (2016: 30), null instantiation licensed by a construction is either definite or indefinite. In the following three subsections, *-ion* nominals derived from strictly and optionally transitive verbs are analysed with respect to null instantiation. Indefinite, Definite, and Generic Null Instantiation will be abbreviated as INI, DNI, and GNI, respectively.

3.1.1. *Examine* vs. *Examination*

Let us begin by looking at the verb *examine* and the much discussed deverbal noun *examination*. According to the OED, the verb *examine* is associated with a variety of meaning components which can be roughly assigned to the domains of law, medicine, and education. The definitions and quotations from the OED as well as contexts from Gigaword further show that this verb is inherently transitive. If it is used intransitively, it takes a prepositional phrase headed by *into* as a complement (cf. (9)). As shown in (10), this option is also available for *examination*.

(9) a. We have had many opportunities of *examining into* the great and original merits of our countryman, Hogarth. (OED)

b. To *examine into* the nature of real good. (OED)

(10) a. The division has refused to reopen the Emlico case, but it is conducting an *examination into* EIC, a Massachusetts company that once was part of Emlico. (Gigaword)

b. That could lead to months of *examination into* Clinton's personal life […]. (Gigaword)

While the prototypical transitive use of the verb and its derivative focuses on the object or entity being scrutinized, the preposition *into*, which conceptually encodes a path, emphasizes the investigative process and signals an in-depth examination of the matter under investigation. An aspectual effect is that the prepositional complement imposes a temporally unbounded reading onto the verb and its nominalization. It should be noted, however, that the preposition *into* does not necessarily force an event reading for the deverbal noun. In a sentence like *The 567-page examination into the worst domestic attack in American history recommended a major reorganization of the government's approach to fighting terrorism* (Gigaword), the modifier *567-page* indicates that *examination* contextually assumes a referential reading, which coincides with the OBJECT pole of the Scale of Reification (cf. Figure 2).

In other contexts, *examine* and *examination* convey habitual or generic readings if they are used intransitively. The following examples illustrate these readings.

(11) a. I *examine* for an hour upon my morning prelection. (OED)

b. Because zero-base budgeting generates new ideas, managers spend more time *examining*, *discussing*, and *deciding*. (OED)

(12) a. A general medical *examination* should take at least 30 minutes; (Gigaword)

b. A laparoscopic *examination* is carried out by making a puncture wound in the abdominal wall and passing a straight scope into the abdominal cavity. (Gigaword)

If the reading "to set or conduct an examination; to act as an examiner" (OED) displayed in (11a) is activated, *examine* assumes a habitual interpretation. As pointed out by Lambrecht & Lemoine (2005: 24), habitual INI is not licensed lexically because there are no restrictions on the verbs that permit this kind of construal. Ruppenhofer et al. (2016: 29) make a similar statement for GNI as exemplified in (11b) and (12). According to these authors, "[v]erbs that usually require an argument to be present (or only allow it to be omitted under conditions of definiteness) can be used in a generic construction with indefinite null instantiation (e.g. *He*

takes and never gives back).[8] Thus, sentences like those in (11) and (12) do not affect the inherent transitivity of *examine*.

This observation is supported by corpus data. A search performed for intransitive uses of *examine* in Gigaword only yielded eight sentences. In three of these sentences, *examine* displays a habitual reading (cf. (13a–c)), and two further sentences are instances of GNI (cf. (13d–e)). Example (11b) from the OED and example (13e) from Gigaword show that habitual or generic readings may be reinforced by a coordination of inherently transitive verbs which remain unspecific as to complementation.

(13) a. "I'll pull out the laptop, and when I'm on Michigan Avenue here in Chicago, put it on a garbage can or on the seat of a bus stop," he said. "You're live, and you can walk around, *examine*, image, zoom in and out. I do it all the time."

b. "The issue was raised by members of the public and others. Our job was to listen, to *examine*, and that's what we've done."

c. "This decision is an example of a court saying, 'We don't want to look, we don't want to *examine*," ' Ms. Dohrn said.

d. The prosecutor *examines*, the defense attorney *cross-examines*, the judge *rules*.

e. "You need to make smart, informed decisions, ask good questions, and not just *assume*," Miller said, "because the Enrons and WorldComs of the world proved that we need to *analyze*, *scrutinize*, *question*, *examine*."

In the remaining three sentences from Gigaword, which are displayed in (14a–c), and in example (14d) from the OED, the complement of *examine* is locally unexpressed. Complements of verbs are understood here to be locally unexpressed if they are realized in the preceding discourse context (e.g. Schenk 2019: 87). Since there are anaphoric relations between the null complement of *examine* and a referent in the preceding context, we are dealing here with DNI.[9]

(14) a. As for the Plan B on each side, let's *examine*: […]

b. While the refugees are at Fort Dix, immigration inspectors will screen them to make sure they are, indeed, refugees from Kosovo and have no criminal records, while doctors *examine*.

c. These are "meditation" wines that you can sit in a corner with and *examine*.

d. Many passed it by with careless tread..But others..Pause to *examine*.[10]

[8] See also Goldberg (2001) and Baeskow (2025a) on this point.
[9] In (14) and further examples displaying DNI, antecedents are highlighted by underlining.
[10] In this example (and in (38d); cf. section 3.2.3), the double dots were taken over from the OED quotations.

While no examples of INI were found for *examine*, the above sentences show that DNI is at least tolerated. This behaviour of *examine* does not come as a surprise. As pointed out by Fillmore (1986: 96), "[o]ne test for the INC/DNC distinction has to do with determining whether it would sound odd for a speaker to admit ignorance of the identity of the referent of the missing phrase."[11] While it is not odd to say "John has just eaten, but I don't know what he ate", an utterance like "They examined yesterday, but I don't know whom (or what)" is pragmatically inadequate. However, given the size of the entire Gigaword corpus (4.5 billion words), the few results indicate that DNI is extremely rare in the context of *examine* and that the syntactic realization of its lexically specified internal argument is definitely preferred. Otherwise, detransitivation should be possible beyond habitual readings, GNI, and occasional occurrences of DNI.

Significantly, Fillmore's (1986: 96) statement quoted above also holds for the deverbal noun *examination*, for which more occurrences of DNI are attested in Gigaword. The following examples and further contexts provided in Appendix 1 show that the Patient argument which *examination* inherited from its verbal base is realized in a non-canonical position. As far as deverbal nouns are concerned, non-canonical is intended to mean that this argument neither appears as the complement of an *of*-PP (e.g. *Barranco's examination of her client*) nor as an Object-poss constituent (e.g. *Wang's examination by the Dutch psychiatrists*).

(15) a. "We've located that vehicle and we're hopeful that *examination* will lead us to some evidence that might indicate where Hudson is," Weir said.

b. Now that the Discovery is in orbit, the *examination* begins.[12]

(16) a. A flexible tube containing a tiny camera will be used to view the colon and identify any polyps. If any are found, a tiny cutter will be inserted into the tube and used to remove them. After the *examination* is complete, the president will be taken off the sedative, which was chosen because it wears off quickly, Tubb said.

b. Toward the end of May, the inspectors succeeded in removing the shell remnants. On June 13, Butler, in Baghdad, let Iraq know that the *laboratory examinations* had shown the presence of VX, a poison gas that can kill in minutes with a few drops.

[11] The abbreviations INC and DNC stand for 'Indefinite Null Complements' and 'Definite Null Complements', respectively.

[12] According to the New-York-Times article in which this sentence appears, it is actually the Space Shuttle orbiter (i.e. the Discovery) itself which is subject to examination.

In these examples, the *-ion* derivative superficially looks like a Simple Event Nominal in the sense of Grimshaw (1990: 45) or Alexiadou & Grimshaw (2008: 2), i.e. like a deverbal noun which lacks an argument structure. As a matter of fact, however, it displays DNI, and its locally omitted Patient argument can be inferred from the preceding discourse context. More precisely, we are dealing here with Topical DNI in the sense of Lambrecht & Lemoine (2005) because the locally omitted argument is part of the discourse topic and hence constitutes 'given' information, which is accessible to the decoder (i.e. the hearer or reader). According to these authors, a prerequisite for Topical DNI is that the entities to which the implicit arguments refer are discourse-active in that mental representations thereof have already been formed in the hearer's mind at the moment of utterance. Moreover, the speaker must ensure that the relation of these topical constituents to the propositions are predictable at the time of utterance.

In (15a) and (15b), antecedents for the null argument, which might be replaced by the overt pronoun *its* and hence establishes anaphoric relations, are available in the sentence in which the nominal occurs (i.e. the NPs *that vehicle* and *the Discovery*, respectively). The examples in (16a) and (16b) show that relations of co-reference between implicit arguments and potential fillers can also be established across sentence boundaries (i.e. *the examination* [*of the colon*]; *the laboratory examinations* [*of the shell remnants*]). This phenomenon strongly suggests that the Patient argument is part of the verb's semantic argument structure and available for inheritance. If verbs and the nominals they derive lacked inherent argument structure, non-locally expressed arguments – especially those which are located beyond the sentence boundary – could hardly be identified as complements. Moreover, the examples in (16) reveal the relevance of the wider discourse context, which tends to be neglected in studies on nominalization.

The examples discussed so far have shown that DNI is at least tolerated by but rarely attested for the verb *examine*, whose rigid transitivity (i.e. *examine* + NP) is lexically determined. The derived noun *examination* differs from its base verb in that it allows the internal argument to be realized in a non-canonical position – provided that it is discourse active (Topical DNI). In these contexts, the derived noun remains a Complex Event Nominal although it superficially looks like a Simple Event Nominal, especially if the antecedent is located beyond the sentence boundary. For any event of examination –

whether referred to by the verb *examine* or by the deverbal noun *examination* in its prototypical event reading, the object of investigation must be identifiable for the decoder (i.e. the hearer or reader).

3.1.2 *Construct* vs. *Construction*

Similar observations hold for the causative verb *construct* and its derivative *construction*, both of which are typically related to building in Gigaword. Detailed analyses performed by Baeskow (2025a) have shown that *construct* is inherently transitive and eludes object omission. Evidence comes from the fact that the whole Gigaword corpus only provides two sentences in which the verb's complement is not syntactically realized, namely (17a) and (17b). In these rare sentences, *construct* does not refer to concrete events, but conveys generic readings. Both sentences involve an antithesis, i.e. a parallelism which is built around opposing expressions. However, since antitheses involving the canonical antonyms *build* and *destroy* are much more frequent in Gigaword, it is likely that those in (17), which involve *construct* and *destroy*, were formed by analogy.[13]

(17) a. In response, Mr Lepper accused the prime minister and his party of belittling him and not consulting him on major policy moves. "They are not made for *constructing*, but for *destroying*. They will agree only with people who are on their knees before them," he said.

b. We *construct*, he *destroys* ... it's a very good game," Gusinsky said in an interview with The Associated Press.

As shown by Baeskow (2025a), the verb *construct* contrasts with its native competitor *build* in that it is largely incompatible with atelic readings induced by INI. While both verbs are lexically classifiable as accomplishments, only *build* quite productively allows for an activity reading if its direct object is indefinitely null-instantiated. By convention, the null argument is interpreted as 'buildings', while an interpretation as 'cars', 'computers', 'bicycles' etc. is precluded, e.g. *Thirty years ago residents cleared the woods next to the old cemetery and began building ∅*.

[13] True antonyms surface for example in the following sentence from Gigaword: *"While our government builds, the armed opposition destroys and we have been in this struggle: build and destroy," he said*.

The inherent transitivity of *construct* is mirrored by the derivative *construction*. Contexts in which the complement of this deverbal noun is syntactically realized are abundant in Gigaword (e.g. *The construction of the cathedral, the world's largest Orthodox church, commissioned by Czar Alexander I, took 44 years and three more Romanov czars*). However, the nominal behaves like *examination* in that it allows for DNI. As outlined above, the semantic argument structure of verbs and their derived nominals plays an important role in the identification of anaphoric relations between null-instantiated arguments and potential antecedents in the preceding discourse context. While an antecedent for the null complement of *construction* is available within the sentences in (18), the anaphoric relation extends across the sentence boundary in (19) (and in further sentences provided in Appendix 1).

(18) a. The company, which is also seeking to buy the remaining land of the mostly vacant plant site, has not yet determined how big the center will be or when *construction* will start.

b. Designed by architect Arthur Page Brown, who died before its completion, the building received its first passengers 22 months after *construction* began.

(19) a. The bridge itself was a grass-roots affair. In 1898, the year it's thought the *construction* began – there are no exact records –, it was a necessity.

b. It's hard to see how any open-minded visitor to Kansas City can fail to be impressed by the Nelson-Atkins Museum of Art, which has few if any peers west of the Mississippi. Lacking private collections on which to build when *construction* began in 1930, the trustees had to buy everything, and in the Depression years their dollars went a long way.

A significant contrast between DNI observed for *examination* (cf. (15) and (16)) and DNI displayed by *construction* in (18) and (19) above results from the fact that these nominals inherit different Proto-Patient entailments (Dowty 1991) from their verbal bases. Dowty reduces the set of thematic roles, whose number and nature has been discussed controversially in the pertinent literature (cf. for example Rauh 1988), to two proto-roles – a Proto-Agent and a Proto-Patient. These roles are defined over sets verbal entailments, as shown in (20) and (21).

(20) Contributing properties for the Agent Proto-Role:

a. volitional involvement in the event or state

b. sentience (and/or perception)

c. causing an event or change of state in another participant

d. movement (relative to the position of another participant)

e. exists independently of the event named by the verb

(21) Contributing properties for the Patient Proto-Role:

a. undergoes change of state

b. incremental theme

c. causally affected by another participant

d. stationary relative to movement of another participant

e. does not exist independently of the event, or not at all

Leaving further details aside, *examine* and *construct* entail the full set of Proto-Agent entailments for their external argument. These fine-grained thematic relations, which are semantically rather than structurally determined, are inherited by *examination* and *construction*. However, while the Proto-Patient of *examine*/*examination* is causally affected by the Proto-Agent's activity without undergoing a definite change of state, the referent of the complement of *construct*/*construction* is brought into existence by the Proto-Agent's activity and hence constitutes an incremental theme. Thus, the progress of the activity performed by the Proto-Agent is mirrored by the Proto-Patient's successive change of state. Given these verb-inherent entailments, the reader who comes across a definitely null-instantiated argument will look for an antecedent which is an 'affected' object in the case of *examine*/*examination* and an 'effected' object which does not exist independently of the event in the case of *construct*/*construction*. Although the Proto-Agent's activity and the resulting change of state entailed for the Proto-Patient are not processed sequentially if the event is reified, these participants and their relations to each other and to the event are preserved by the nominalizations – as outlined in section 2. Again, these relations would be concealed if the argument structure of deverbal nouns was syntactically determined rather than passed on by inheritance, and once again, an inspection of the wider discourse context is necessary to determine whether a nominalization actually lacks

a complement or whether a non-locally expressed complement is available and discourse active.

To sum up, the contrastive analyses of the two derivationally related verb-noun pairs *examine*/*examination* and *construct*/*construction* suggest that the nouns largely follow their inherently transitive base verbs with respect to the realization of arguments in their event readings and that this behaviour is an indicator of argument inheritance. Although the complements of the deverbal nouns are not necessarily realized as *of*-PPs or Object-poss phrases, referents for the locally omitted arguments must be available in the discourse context (DNI). Without an antecedent, a sentence like *The examination is scheduled this morning in Fort Worth*, in which *examination* displays an event reading, is as incomplete as **The doctor examined* ∅; see also Grimshaw (1990: 47) on this point.

3.1.3 A Sample of Further *-ion* Nominals

The two case studies presented in section 3.1.1 and 3.1.2 have shown that the deverbal nouns *construction* and *examination* follow their transitive base verbs closely in their event readings. If the canonical *of*-PP or an Obj-poss NP is missing, a referent for the locally omitted complement must be retrievable from the (wider) discourse context. Thus, the apparent flexibility of nominalizations with respect to argument realization seems to be restricted for prototypical event readings. While further in-depth analyses of verb-noun pairs are beyond the scope of this study, additional evidence for the claim that the argument-taking behaviour of deverbal *-ion* nominals is not independent of their base verbs comes from a random sample of sentences extracted from the English Web 2021 (enTenTen21) provided by Sketch Engine. These sentences include six further *-ion* nominals whose base verbs – according to the OED – are either obligatorily transitive (*installation*, *implementation*, *evaluation*) or allow for intransitive readings (*translation*, *discussion*, *exploration*). In order to ensure that only event readings are displayed, the search was restricted to contexts in which the nominals are immediately followed by the verb *take* (e.g. *take place*; *take X time*) or by one of the aspectual verbs *begin*, *start*, or *continue*. In further contexts, the nominals are preceded by the temporal adjectives *frequent* or *constant*, and *of*-PPs were filtered out. Thus, it is possible to test whether inherited complements are absent or whether referents for null complements are

retrievable from the (wider) discourse context. As exemplified in (22), (23) and in Appendix 2, the additional sample is compatible with the observations obtained from the detailed contrastive analyses (section 3.1.1 and 3.1.2).

(22) a. Kano was known as a REMOTE site and *installation* began in 1960. (DNI)

b. E-governance brings complex challenges. "Getting from the first conversation to full *implementation* takes several years," Tammearu says. (DNI)

c. While the new fighter can be operated by a single pilot, it is a two-seat aircraft with an increased payload capacity, electronic flight controls, advanced cockpit and mission systems and software capabilities. Before testing and *evaluation* begins, aircrews will familiarize themselves with the aircraft through local airspace flights. (DNI)

(23) a. Although the Bible has been translated into almost every language, this English version remains the most influential of all. Timewise, the actual *translation* took three years, as did the review. (DNI)

b. This method helps you to avoid constant *translation* and instead allows you to think in French. (INI)

(24) a. Discussion of the proposed 1998-2000 workplan for Commission 7 was led by Dr Paul Munro-Faure (Vice-Chairperson, UK) and preliminary comments were received on its structure and likely topics. The *discussion* continued on Friday 9 May. (DNI)

b. The group's live *discussion* started at 7:30 p.m., and continued live until 10:30 p.m. (INI)

(25) a. The Sculpture Program is an open laboratory for the investigation and manipulation of the world around us. The *exploration* begins with the physical world of objects and materials and extends through the conceptual realm of ideas and cultural dialogue. (DNI)

b. Whenever you're ready to travel, take the wheel and let the *exploration* begin with 30% off Avis car rentals in California, Las Vegas, Texas, Florida, New York, Boston, and other top destinations in the United States. (INI)

This additional sample shows that non-locally realized arguments surface in the context of both types of *-ion* nominals, namely those derived from strictly transitive verbs (e.g. *install*, *implement*, *evaluate*) and those derived from optionally transitive verbs (e.g. *translate*, *discuss*, *explore*). As shown in Appendix 2, a referent for the inherited but definitely null-instantiated argument is frequently provided sentence-externally. By contrast, INI most naturally works for nominals whose base verbs, too, can be used intransitively. In the latter case, the complement is "understood" without contextual information, but remains schematic. As indicated already in the introduction to section 3.1, the default interpretation of indefinitely null-instantiated arguments is guided by world knowledge as

represented in Frames (e.g. Fillmore & Baker 2009) and knowledge regarding the verb's selectional preferences (e.g. Rice 1988, Jackendoff 1990, Resnik 1993, Baeskow 2025a). For example, according to FrameNet[14] – the comprehensive lexicographic database initiated by Charles Fillmore and colleagues – the verb *translate* evokes the 'Translating' frame in its prototypical reading "to express the sense of (words or text) in another language". This frame is composed of five core Frame Elements (FEs), namely the 'Cognizer' (i.e. the person who carries out the translation), the 'Content', a 'Source_Representation', a 'Source_Symbol', a 'Target_Representation', and a 'Target_symbol'.[15] The semantic relations holding between these FEs are spelled out in the frame definition: "A Cognizer produces a Target_symbol which represents, in the Target_representation format, a Content that pre-exists in the form of a Source_symbol in a Source_representation format." If the verb *translate* displays INI (e.g. *A security guard translated* ∅; Gigaword), the missing object argument can be filled in by frame information. In other words, frame information enables the decoder (i.e. the reader or hearer) to form a schematic representation of the implicit argument which is sufficient to make sense of the utterance.

Empirical support for the postulate that the implicit object argument of *translate* is of the semantic type 'Content' comes from corpus data. If we generate a Word Sketch for this verb in Sketch Engine, the column "objects of translate" displays the first twelve nouns which typically fill the verb's direct-object position in the 52-billion-word corpus enTenTen21. In Sketch Engine, typicality is calculated on the basis of the LogDice score, which indicates how strong the collocation between two lexical items is, e.g. *translate* and *text* (8.2), *Bible* (7.8), *word* (7.4), *document* (6.9), *poem* (6.8), etc. Unlike other statistical association measures (e.g. the MI score or the T-score), the LogDice score is restricted to the maximal value 14.[16] Since *translate* and its attested complements also collocate with other lexical items, the values specified above only indicate medium collocational strength. Nevertheless, they reveal that the verb *translate* selects for nouns which can be considered instantiations of the abstract FE 'Content' of the 'Translating' frame. Significantly, the

[14] https://framenet.icsi.berkeley.edu/

[15] Unlike peripheral FEs (e.g. Manner, Time, Place), core FEs are semantic arguments which constitute necessary components of a frame; cf. Ruppenhofer et al. (2016: 23).

[16] An advantage of this restriction is that the LogDice score is independent of the corpus size, so that it can be used to compare scores between different corpora.

compatibility between frame information and selectional preferences also holds for the derived noun *translation* which, like its base verb, allows for INI. If the complement of this noun is indefinitely null-instantiated, as in sentence (23b), it is inferable from the 'Translating' frame as well because frames are not restricted to lexical units of the category 'verb'. Again, the missing argument is interpretable as 'Content', and again, this semantic type is mirrored by collocations. If we generate a Word Sketch for *translation* in Sketch Engine, the column "prepositional phrases" is of particular relevance because it reveals the typicality of nouns occurring in the *of*-PP. In order to obtain a ranking of these nouns in terms of typicality, we need to click on the three dots on the right-hand side of this column and select the option 'Multiword Sketch' (rather than 'concordance', which yields an unordered set of sentences). The attested complements of 'translation + *of*' thus obtained include *Bible* <9.7>, *text* <8.8>, *testament* <8.7>, *poem* <8.0>, *scripture* <7.9>, etc., all of which are represented by the semantic type 'Content' (and the Proto-Patient role at a higher level of abstraction).

Similarly, the complements of *discuss* (e.g. *Leave a comment if you'd like to discuss!*; enTenTen21) and its derivative *discussion* (cf. (24b)) allow for INI provided that the discourse does not require a specification of the FE 'Topic', which according to Frame Net "expresses the subject that the Interlocutors are trying to come to some agreement about." The schematicity of the complement is reflected by the top collocations attested for *discuss* (e.g. *issue* <9.3>, *topic* <9.0>, *matter* <8.2>, *possibility* <7.6>) and for *discussion* (e.g. *issue* <9.1>, *topic* <8.6>, *matter* <7.1>, *subject* <7.0>) in Sketch Engine.

According to the OED, the intransitive use of the verb *explore* is restricted to contexts dealing with the exploration of unknown territory or the search *for* something – esp. for minerals, oil, or other raw materials. As the following examples show, these are the contexts in which the derivative *exploration*, too, allows for INI.

(26) a. Travel and *explore*. Going somewhere new is a great way to open your mind. (enTenTen21)

b. The *exploration* begins in the Dinosaur Discovery Maze! (enTenTen21)

(27) a. Geology students of the University of Oregon in the past summer *explored for* fossils in Crook, Grant, Wheeler and Lake counties. (OED)

b. *Exploration for* oil and gas reserves has turned to more remote, and sometimes more costly, locations. (OED)

The implication of a place or territory is also inherent to the 'Scrutiny' frame evoked by *explore* (and *exploration*). According to the definition in FrameNet, a 'Cognizer' (i.e. a person or other intelligent being) is paying close attention to something, the 'Ground', in order to discover and note its salient characteristics. Moreover, the 'Cognizer' may be interested in a particular characteristic or entity, the 'Phenomenon', that belongs to the 'Ground' or is contained in the 'Ground'. This additional piece of frame information accounts for sentences like those in (27), where the 'Phenomenon' is the raw material. The nominal *exploration* closely follows its verbal base *explore*. In both readings, the 'Ground', i.e. the place or territory to be scrutinized, may remain unexpressed.

The examples briefly discussed in this section provide additional support for the claim that the argument selection behaviour of derived nominals in their event readings is neither arbitrary nor more flexible than the argument selection behaviour of their verbal bases. If the verbs are strictly transitive, the corresponding nominalizations are not likely to display INI either. However, as shown for *examination* (section 3.1.1), for *construction* (section 3.1.2), and for *installation*, *implementation*, and *evaluation* (cf. the sentences in (22) above), DNI is tolerated by these nominals because referents for the locally omitted arguments are retrievable from the discourse context. Applying Fillmore's (1986) test criterion for Indefinite and Definite Null Instantiation (cf. section 3.1.1) to derived nouns, it would be odd to say "The installation takes 2 days" without revealing the entity to be installed, whereas an utterance like "This method helps you to avoid constant translation" is perfectly interpretable without reference to a particular text or content. For both verbs and derived nominals, topical DNI (cf. section 3.1.1) frequently occurs in news articles if the argument, which is definitely null-instantiated later in the text, is part of the discourse topic. It may even surface in the headline. If a definitely null-instantiated argument is topical, it is readily reactivated by the reader when he/she comes across the verb or deverbal noun to whose argument structure it belongs.

However, it is a well-known fact that deverbal nouns also have non-event readings in which the argument structure of the underlying verbs is only partially realized, or not at

all. These readings are discussed and systematized on the basis of the Scale of Reification in the following section.

3.2 Reification towards the SUBSTANCE and OBJECT Pole

The reactivation of relations and phases which define the underlying situation is not always possible or may remain fragmentary because of the well-known polysemy displayed by deverbal nouns. An important point to be made here is that the applicability of syntactic strategies to motivate event readings (e.g. the use of temporal or aspectual modifiers) depends on the degree of reification of the underlying situation. Recall that according to Radden & Dirven (2007), situations are reified as either objects or substances. This observation has been elaborated here in a way that SUBSTANCE readings and OBJECT readings do not form a dichotomy, but a bidirectional continuum on a Scale of Reification, as shown in Figure 2 (section 2). The continuum is determined by the accessibility of the temporal relations and argument structure, which decreases towards the SUBSTANCE and the OBJECT pole. It should also be observed that the positions on the scale are symmetric, i.e. each position to the left of the 'Prototypical Event' corresponds with an opposing position to the right of the 'Prototypical Event', i.e. 'Quantity' – 'Instance(s) of an event', 'Result State' – 'Result Constitution', 'Generic Concept' – 'Conrete Entity'.

'Quantity' readings (e.g. *all*/*some construction*) and 'Instance(s)-of' readings (e.g. *three examinations*) are closest to the 'Prototypical-Event' reading. Although they tend towards the SUBSTANCE and the OBJECT pole, respectively, they are not indifferent to time and hence compatible with aspectual verbs like *start*, *stop*, *continue* etc. and other event markers (e.g. *take place*). Thus, they contrast with the 'Result-State' (e.g. *the congestion caused by mindless cellphone use on city sidewalks*) and 'Result-Constitution' readings (e.g. *the robust construction of the bridge*), which may still display syntactic relics of the base verb's argument structure, but for which temporal factors are inaccessible. The last pair, namely 'Generic Concept' (e.g. *to study composition*) and 'Concrete Entity' (e.g. *Naum Gabo's Kinetic Construction*), is furthest away from the canonical event reading and coincides with the SUBSTANCE and the OBJECT pole, respectively. At the SUBSTANCE pole, the underlying events are conceptualized as an unbounded, homogeneous 'mass' for which no temporal composition is discernible. At the opposite extreme, reification as object

coincides with the highest degree of individuation and physical boundedness. Nevertheless, the readings located at the opposite extremes of the Scale of Reification are not entirely independent of the events denoted by the base verbs either. While the verb's internal argument may surface as the modifier of a synthetic compound in the 'Generic-Concept' reading (e.g. *bridge construction*, *road construction*), the 'Concrete Entity' is a participant that stands in a particular relation to the underlying event (e.g. in the relation of the Agent if the noun *commission* is used to refer to a body of people). In the following sections, this proposal will be exemplified for each of the positions of the Scale of Reification, and more examples of individual patterns are provided in Appendix 3.

3.2.1 'Quantity' vs. 'Instance(s) of an Event'

Let us begin by looking at selected 'Quantity' readings, which are represented immediately to the left of the 'Prototypical-Event' reading and which are typically invoked by quantifiers such as *all*, *some*, or *most*. These quantifiers are compatible with deverbal nouns ending in *-ion* if their denotation can be conceptualized as an 'aggregate' (or overall quantity) of the activity denoted by the verbal base, or as a subset thereof. In contexts like those represented in (28), summary scanning manifests itself most obviously. Here we are dealing with abstractions over construction activities for which the participants involved are irrelevant. Moreover, these activities are not necessarily restricted to a particular place, but may be distributed over different locations.

(28) a. *All construction* is targeted to be completed by 2010, officials said.

b. *Some construction* also is being done to accommodate the F-150 SuperCrew and apparently the Blackwood.

c. *Most construction* takes place at night, according to The Macmillan Illustrated Animal Encyclopedia.

Syntactically, the abstraction over construction activities correlates with the mass interpretation of the deverbal noun. Note that in German, the meaning of *construction* in (28) is expressed by the compound *Bauarbeiten* (literally 'construction works'), which is inherently marked for plural (**die Bauarbeit* 'the construction work') and renders the aspect of collectivity even more tangible. Like *construction* in (28), this noun is unspecific with respect to potential results of or changes caused by the building activities.

Although *construction* deviates from the prototypical event reading in its 'Quantity' readings because it lacks syntactically realized arguments, it is important to note that temporal relations still play a role. Evidence comes from the nominal's compatibility with aspectual expressions like *begin*, *continue*, *stop*, *be completed*, *be under way* or event markers like *take place* or *be done*. As compared to canonical event readings (e.g. *The construction of the chateau began in 2000*) it is interesting to observe that aspectual verbs are followed by the preposition *on* in quite a few contexts in which *construction* displays a mass reading.[17] For example, while the deverbal noun refers to unspecified quantities of construction activities in (28), it conflates all the activities which eventually lead to the completion of a *particular* event in (29). In each of these examples, the aspectual expression picks out a stage of this goal-directed 'bundle of activities'.

(29) a. Last year, *construction began on* a new home for the Tacoma Art Museum, which is to open next year.

b. In the same area in Lagos, *construction has stopped on* a Total gas station that was being built by a company believed to belong to Akhigbe.

c. Copper will be trucked out, and so *construction is already underway on* a two-lane highway across Laos from Thailand to Vietnam.

In each of these sentences, the phase of the scheduled construction event, which is referred to by the aspectual verb, corresponds with a certain state of the Proto-Patient. In (29a), the temporal adverb *last year* and the verbal constituent *began on* indicate that part of the building which is intended to accommodate the museum must already be finished. As for (29b), the gas station remained unfinished because all construction work was cancelled. In example (29c), the building activities which constitute the event are in progress, and the state of the two-lane highway corresponds with this stage of the event, i.e. it is neither in an initial state nor finished. Each of these sentences presents us with a snapshot that depicts a stage of the abstract nominalized event and the object under construction rather than a sequence of phases which lead to the object's creation. In other words, the object's gradual coming into existence relative to an Agent's activity, which is referred to as 'homomorphism' (Dowty 1991: 567), is again irrelevant under summary scanning.

[17] Of course, sentences in which the preposition *on* expresses a temporal relation do not fit the pattern in (29), e.g. *Construction began on January 3, 1870*.

Although the phrases *the Tacoma Art Museum* (29a), *a Total gas station* (29b), and *a two-lane highway across Laos from Thailand to Vietnam* (29c) do not constitute syntactic complements of *construction*, they are interpretable as semantic arguments which the deverbal noun inherits from its base verb *construct*.[18]

The position of the 'Quantity' reading to the left of the 'Prototypical-Event' reading corresponds with the position of the 'Instance(s)-of' reading, which is located immediately to the right of the 'Prototypical-Event' reading on the Scale of Reification. Although both readings (i.e. 'Quantity' and 'Instance(s) of') conceptualize very different aspects of the underlying event, they have in common that they allow for temporal anchoring, as shown for *construction* in (28) and for *examination*, *discussion*, and *transaction* in (30). Of course, 'Instance(s)-of' readings contrast with 'Quantity' readings in that they allow for pluralization, which renders them more 'thing-like'.

(30) a. *Each examination* lasts three to five minutes.

b. *Three discussions* taking 3 hours; this means one hour per discussion.

c. This case involved *a single transaction*, from which Mr. Howard received no personal benefit.

Finally, it should be pointed out that the abstractness of reified events may be compensated by a variety of adjectives. For example, as far as *examination* is concerned, the data from Gigaword show that this deverbal noun tends to be modified with respect to intensity (e.g. *close, closer, deeper examination showed/revealed that…*), progression (e.g. *further*, *initial*, *preliminary*), or a domain of expertise (e.g. *medical*, *physical*, *forensic*). These modifiers render the abstract examination event more transparent and help the reader to infer information regarding attention to detail, the stage of the event, procedures that are compatible with the domain of expertise, etc.

3.2.2 'Result State' vs. 'Result Constitution'

We will now turn to the result readings of *-ion* nominals, whose classification is less straightforward because they make reference to different facets of the underlying events.

[18] Note that a 'stage' reading is also conveyed by the construction *examination into*. As pointed out in section 2.1, the preposition *into*, which conceptually encodes a path, emphasizes the investigative process and signals an in-depth examination of the matter under investigation.

In the literature (e.g. Bierwisch 1990–1991); Lieber 2016; Olsen 2020), two subtypes of result readings have been identified, namely 'Result State' and 'Result Object'. While deverbal nouns ending in *-ion* refer to a state which results from an event in their 'Result-State' reading (e.g. *The pollution of the lake posed a danger to the community*), they denote the outcome or product of the event denoted by the base verb in their 'Result-Object' reading (e.g. *The construction on the hill was in ruins*).[19] Although this distinction is crucial, the data suggest that there is a further subtype of the result reading which has received little attention in the literature and which – unlike the 'Result-Object' reading – can be described as 'semi-concrete' rather than fully concrete. This subtype will be referred to here as 'Result Constitution'. Lieber (2016: 122) provides an example of the reading in question (cf. (31)), but describes it very generally as 'result'.

(31) She explains that even the DDC, which is used worldwide, is not the ultimate system, and owes its success to external factors as much as to its robust construction.

According to Lieber (2016: 124), a result reading arises "when there is nothing in the surrounding context that suggests a concrete reading." On the other hand, the adjective *robust*, which modifies *construction* in (31), signals a certain degree of concreteness. This ambivalence, which also manifests itself in the sentences in (32) and (33), provides further support for the hypothesis that reification is gradient.

(32) But the Empire State's *construction* was far denser.

(33) a. Already the *composition* of the vaccine for the next flu season, which unofficially begins Nov. 1, has been decided by the Food and Drug Administration's Vaccines and Related Biological Products Advisory Committee.

b. But the *composition* of the Senate is significantly different than it was in 1994, when gun-control advocates had their way.

In these examples, the *-ion* derivatives refer to the physical makeup of an entity (32), the chemical composition of a substance (33a), or the internal structure of an institution (33b). Although nominalizations do not pluralize in the 'Result-Constitution' reading (e.g. **the Empire State's constructions*), they are close to the OBJECT-pole of the Scale of Reification. Like *-ion* nominals denoting products (i.e. result objects), but unlike those denoting

[19] These examples were taken from Olsen (2020: 70) and Lieber (2016: 104), respectively.

instances of events (e.g. *each examination lasts three to five minutes*), they are incompatible with temporal or aspectual modification (e.g. **the composition of the Senate in two weeks*).

Significantly, the 'Result-Constitution' reading and the 'Result-State' reading occupy opposing positions on the Scale of Reification because they differ in their degree of concreteness. While an *-ion* derivative materializes the result by highlighting the physical or internal makeup of some entity in its 'Result-Constitution' reading, it refers to a more abstract, 'substance-like' state which is the result (or by-product) of an activity in its 'Result-State' reading. The latter reading is incompatible with adjectives like *robust* or *dense* and seems to be well motivated by deverbal nouns whose base verbs lack a Proto-Agent or which are low in agentivity. The following examples from the OED show that nominalizations formed from inchoative (variants of) verbs like *hydrate*, *mineralize*, or *fossilize* quite systematically display a 'Result-State' interpretation.

(34) a. In both conditions of *hydration* the crystals of sulphate of nickel are very beautiful.

b. The final result of the decomposition of organic bodies by bacteria has been termed *mineralization*.

c. There were also found a variety of other marine substances, in a state of *fossilization*.

In their inchoative readings, the base verbs of these derivatives, which belong to the scientific vocabulary, denote "internally caused" eventualities in the sense of Levin & Rappaport Hovav (1994: 49), i.e. eventualities which happen without the intervention of an agent.

Moreover, as shown by Bierwisch (1990–1991: 70–72) for German nominalizations formed from psych verbs like *Verärgerung* "annoyance", *Frustration* "frustration", or *Irritation* "irritation", the result state may be caused by a non-human Agent, e.g. *Die Verärgerung* (*der Bewohner*) *durch den Lärm dauerte an* "The annoyance (of the inhabitants) by the noise continued". In this sentence, there is no intentionally acting Proto-Agent that brings about the state of the inhabitants. Instead, the result state is caused by an external factor or stimulus, which merely displays the proto-agent entailment 'causation'. The low degree of agentivity in result-state readings is also mirrored by Olsen's (2020: 70) example *The pollution of the lake* (**by the factory*) *posed a danger to the community*. The situation depicted in this sentence is not brought about intentionally either. Like the noise in Bierwisch's example, the pollution of the lake can rather be viewed

as a negative side-effect of some activity which is not further specified. Both readings discussed in this section – the 'Result-State' and the more concrete 'Result-Constitution' reading – approach, but do not yet coincide with the SUBSTANCE pole and the OBJECT pole of the Scale of Reification, respectively.

3.2.3 'Generic Concept' vs. 'Concrete Entity'

Finally, we will turn to those readings of *-ion* nominals which are located at the leftmost and the rightmost pole of the scale of Reification. These are the readings which display the highest degree of abstractness and the highest degree of concreteness, respectively, and which are referred to here as 'Generic Concept' and 'Concrete Entity'. In one subtype of the 'Generic Concept' reading, deverbal *-ion* nominals refer to economic factors which can be measured statistically. Although this reading is close to the 'Quantity' reading (cf. (28)), an important difference is that it is incompatible with aspectual verbs like *begin*, *stop*, *continue*, etc. because there is no occurrence in real time. In (35a), for instance, *construction* refers to the total amount of construction activity that took place in a particular region or in a given survey period. The course of this abstract, internally unstructured whole is subject to economic fluctuations, which are typically expressed by motion verbs such as *fall*, *rise*, *decrease*, etc. If the derivative *production* surfaces in the subject position of these motion verbs, as in (35b), the dynamics of the output of goods and services in a particular sector or region is evoked. This kind of abstract movement, which depends on a variety of factors such as long-term investments, building permits, weather conditions etc. (in the case of *construction*) or supply and demand, availability of resources, supply chains, etc. (in the case of *production*), can only be measured statistically. In other words, it is abstract to a degree that it cannot be perceived as going on in the extra-linguistic world. Abstract movement can also be observed for *consumption* in (35c).

(35) a. In the Midwest, *construction* fell 15 percent; in the South it dropped 12 percent.
b. Trade rumors swirled, and Hull's *production* plummeted.
c. A simple and fundamental principle of economics is that *consumption* increases as goods become more attractive to the consumer.

These sentences involve an interesting interaction of summary scanning and sequential scanning. On the one hand, the mass readings of *construction*, *production* and *consumption*,

which bundle all the components that make up the economic concepts CONSTRUCTION, PRODUCTION, and CONSUMPTION, are the result of summary scanning. On the other hand, each of the deverbal nouns occurs in the subject position of unaccusative verbs like *fall*, *plummet*, or *increase*. According to Lieber (2004: 29–35) verbs like these bear a semantic feature [+IEPS] "Inferable Eventual Position or State", which encodes a PATH consisting of a sequence of PLACES or STATES. Given the two modes of construal identified in Cognitive Linguistics, this definition suggests that the processes denoted by these verbs are scanned sequentially. However, since we are dealing here with abstract rather than physical movement, the sentences in (35) are describable as instances of fictive motion. According to Matlock (2004), a characteristic of fictive motion is that a motion verb describes an inherently static scene, "but evokes the simulation of 'movement' or 'scanning' along a trajectory through imagined space." As far as the above sentences are concerned, the reader as the 'conceptualizer' is invited to mentally track the imaginary path which metaphorically represents the scalar change.

Significantly, the temporal structure of the base verbs is no longer accessible in these compact, non-eventive readings of *construction*, *production*, and *consumption*. By contrast, the inherited internal argument can be realized syntactically, i.e. in the form of an *of*-PP. However, as shown in (36), the *of*-PPs do not induce event readings, but merely restrict the type of the economic factor which is subject to scalar change and to which the figures apply.

(36) a. *Construction <u>of single-family homes</u>* rose 2.7 percent in July, while *construction <u>of multi-family buildings</u>* fell.

b. *Production <u>of leather goods</u>* fell 19.4 percent, and *production <u>of textiles</u>* declined 10.8 percent.

c. Brazilian *consumption <u>of oil products</u>* fell 2.9 percent in December, part of a general economic slowdown caused by government measures to cut spending and raise taxes.

An even higher degree of abstraction is achieved if an *-ion* nominal is interpreted as a sector or domain of expertise (e.g. *Photography wasn't something Art's father taught him, but construction was*). In this subtype of the 'Generic-Concept' reading, neither temporal modification nor syntactic argument realization are possible. Nevertheless, a "relic" of the

inherited internal argument may surface as the modifier of a synthetic compound headed by the deverbal noun, e.g. *bridge construction*, *oil production*, *energy consumption*.

At this point, it is important to emphasize that the readings discussed so far are transpositional and hence semantically related to the meaning of their base verbs. According to Olsen (2020: 69), "[…] a derivational process is transpositional if the semantic change incurred is limited to a change of category with the lexical semantics of the base left otherwise intact." This criterion is not fulfilled if deverbal nouns refer to 'Concrete Entities' and hence display the highest degree of reification (e.g. *The construction is just huge*). In the literature (e.g. Grimshaw 1990, Borer 2003, Bierwisch 2015, Lieber 2016, Olsen 2019, 2020), it has been observed that the so-called "R[eferential] nominals" differ from event nominals in that they do not take arguments and display a variety of unpredictable readings. In these "secondary readings" (Lieber 2016; Olsen 2020), deverbal nouns are countable and denote a participant involved in the underlying event. As far as *-ion* nominals formed from telic verbs are concerned, the profiled participant is typically though not necessarily the product of the underlying event, which is also referred to as 'inanimate patient' (Lieber 2016: 62) or 'result object' Olsen (2020: 72). If *-ion* nominals denote the concrete outcome of an activity, they are incompatible with temporal or aspectual expressions (e.g. **The compositions took an hour*) and do not allow for the syntactic realization of the internal argument of the verbal base, e.g. *Beethoven's compositions* (**of sonatas*). However, a significant observation made by Bierwisch (1990–1991: 74–76) and Lieber (2016: 125f) is that an *of*-PP is allowed if the complement of the preposition denotes an entity which exists independently of the event denoted by the base verb. For example, while the sonatas cannot be specified as a complement in the above sentence because they are the 'effected objects', i.e. the objects brought about by composing (hence the co-reference of *compositions* and *sonatas*), nouns which "elaborate" (Lieber 2016: 125) the denotation of the deverbal noun are acceptable as complements.[20] The following examples from Gigaword illustrate this point.

[20] Bierwisch (1990–1991: 74–76) discusses this subtle difference on the basis of the German result nominals *Komposition* ("composition") and *Vertonung* ("setting to music").

(37) a. Golden says CuraGen has created *visualizations* of known genes and compares them to newly-discovered genes that may control similar functions in the body.

b. His debut came in a Stratford *production* of Christopher Marlowe's "Tamburlaine the Great" in 1956, directed by Guthrie.

c. Recent archeological finds and new *interpretations* of historical documents, he said, cast a new light on the Vikings, also known as the Norse […]

Apart from the Inanimate Patient, further participants which can be encoded in *-ion* nominalizations are the Agent, the Instrument/Means, the Theme, the Location, and the Path (Lieber 2016, Olsen 2020). Given the polysemy of deverbal nouns in their referential readings, Bierwisch (1990–1991, 2015) proposes an analysis within the framework of Generative Grammar according to which these readings are metonymic extensions of the (transpositional) event reading to which they are conceptually related.[21] Formally, the metonymic readings are created by a shift operation which shifts the reference from the event to a participant in the event, or to the location of the event. As a result of the metonymic shift, the arguments which the nominal inherited from its verbal base are suppressed.

From the point of view of Cognitive Linguistics, however, a formal shift operation is not even required because the derivative itself in its event reading may provide mental access to something that is related to the event – especially to a participant involved in it. A metonymic approach to derivational polysemy has been proposed for example by Ryder (1991) and Panther & Thornburg (2001) for *-er* derivatives which deviate from the prototypical deverbal agent nouns (e.g. *Wall Streeter*, *eater* "apple", *blue-chipper*) and by Brdar & Brdar-Szabó (2014) for the noun *collection*, which displays a variety of meaning components. If Lieber (2016: 122) and Olsen (2020: 27) state that deverbal nouns may refer to the Agent, the (Inanimate) Patient, the Instrument, the Location, or a Path in their secondary readings, these relations can be directly expressed in terms of metonymy. Apart from sentence (38d), which was taken from the OED, all the examples presented below were taken from Gigaword.[22]

[21] Cf. Olsen (2020: 73f) for a detailed discussion of Bierwisch's approach.

[22] The reversal of metonymic relations like those presented in (38) motivates the construal of events from participants. This process is traditionally referred to as noun-to-verb conversion, e.g. INSTRUMENT FOR ACTION (*to paper-clip*), GOAL FOR MOTION (e.g. *to orbit*), AGENT FOR ACTION (*to author*); cf. for example Kövecses &

(38) a. The *association* argued that payment for only two-tenths of 1 percent of home health care visits was denied as unnecessary. (EVENT FOR AGENT)

b. The *addition* was a brilliant idea, long overdue. (EVENT FOR THEME)

c. Sometimes, the *application* can be closed and then restarted, but sometimes your entire system must be restarted. (EVENT FOR INSTRUMENT)

d. The island..at the *bifurcation* of the Rhine and the Waal. (EVENT FOR LOCATION)

A metonymic relation is established if a concept A (the metonymic vehicle or source) stands for or represents a concept B (the metonymic target) which is related to A in a way that it can be readily inferred from this source concept without being made explicit. According to Brdar & Brdar-Szabó (2014: 332), the basic function of metonymy is that of a "mental shortcut" which allows speakers to refer to concepts whose expression would otherwise be linguistically complex in a more economical way (e.g. *the ham sandwich* vs. *the person ordering a ham sandwich*). The metonymic approach to secondary readings is well compatible with the summary view of the prototypical event reading motivated by *-ion* derivatives (and other deverbal nouns). While the relations holding within the event are backgrounded in the course of the nominalization process, sentences like those in (38) show that the event as an abstract, atemporal whole can serve as a conceptual link to one of the participants it incorporates. At a higher level of abstraction, the relations in (38) instantiate the metonymy WHOLE FOR PART, which mirrors the holistic view of the reified event. Moreover, while syntactic and word-internal argument realization are blocked at the OBJECT pole of the Scale of Reification, the metonymic activation of individual participants further supports the view that deverbal nouns inherit the semantic argument structure of their verbal bases. As pointed out in section 1, approaches that dispense with argument inheritance would have to explain how roles such as Agent, Patient, or Location are identifiable for the respective referents because these roles have to be defined relative to some event denoted by the base verb. Although *-ion* nominals with 'Concrete-Entity' (i.e. referential) readings are not transpositional, they are not entirely idiosyncratic if a cognitive link between the prototypical reified event and a participant involved in the event can be established.

Radden (1998), Dirven (1999), Ruiz de Mendoza Ibáñez & Pérez Hernández (2001), Bauer (2018), Baeskow (e.g. 2021, 2022).

As far as language use is concerned, it is assumed here that secondary referential readings like those exemplified in (38) and supplemented in Appendix 3 are motivated by paradigmatic pressure, i.e. "the need to fill an empty slot in the derivational paradigm" (Lieber 2016: 132). As pointed out by Lieber (2004: 73f), a paradigmatic need may be satisfied either by means of a default process (e.g. conversion or the substantivation of a participle) or by forming a derivative by means of a productive and semantically close affix and to tolerate potential violations of the affix's selectional restrictions (e.g. *sleeper*, *greener*). As shown in (38), a further possibility is metonymic meaning extension – a non-derivational process which creates new senses directly from conventionalized derivatives (cf. Olsen 2020: 73 for a similar view).

4. Summary and Outlook

Proceeding from the cognitive view that nominalization (exemplified here for *-ion* nominals) involves the reification and hence a more holistic construal of the events denoted by the base verbs, this article proposed that the well-known polysemy of deverbal nouns, which manifests itself in their oscillation between event readings and referential readings, depends on the degree of reification of the underlying events. Significantly, reification is not reduced to the mass-count distinction, but understood as a continuum on a bidirectional scale (cf. Figure 2 in section 2). While prototypical event readings occupy a medium position on the Scale of Reification, other readings tend towards or coincide with the SUBSTANCE pole on the left or the OBJECT pole on the right, and the verb-like behaviour of the deverbal nouns decreases accordingly. Thus, there are readings between the opposite poles of the Scale of Reification which render the underlying events more 'substance-like' or more 'object-like'. Moreover, each position to the left of the 'Prototypical-Event' reading contrasts with a position to the right of this reading. Two detailed contrastive studies of the pairs *examine – examination* and *construct – construction* as well as a more general discussion of six further verb-noun pairs suggest that nominalizations follow their verbal bases with respect to argument realization and omission in their prototypical event readings. While "relics" of the argument structure are preserved even in less central readings, the deverbal nouns' compatibility with temporal

and aspectual modifiers decreases towards the SUBSTANCE and the OBJECT pole of the Scale of Reification. Significantly, the readings of a deverbal noun may be distributed over different positions of the scale – depending on the context.

Due to the high frequency of occurrence of deverbal nouns in the newswire articles provided by Gigaword and the well-known polysemy of these nouns, the analyses presented in this study had to be restricted to qualitative corpus analyses of *-ion* derivatives. Nevertheless, the Scale of Reification proposed here is intended to serve as a template for further studies, which might include analyses of derivatives displaying different nominalizing suffixes, or quantitative analyses. Although the symmetric arrangement of the positions should be preserved, the scale is dynamic and hence allows for extension (or modification, if required).

In view of doublets like {construct}$_V$: {construction}$_N$ vs. {construe}$_V$: {construal}$_N$, {produce}$_V$: {production}$_N$ vs. {produce}$_V$: {produce}$_N$, and other forms displaying Latinate roots such as {erect}$_V$, which might suggest the possibility of back-formation, an anonymous reviewer points out that the identification of potential correlations between morphological patterns and semantic attributes might be worth pursuing. At this stage, the interesting question whether such correlations exist cannot be answered because the matter is too complex and requires precise empirical analyses. In particular, the answer is complicated by the fact that many of these complex forms are not the results of transparent English word-formation processes, but borrowings from Latin or French.[23] However, in line with the well-established view that redundancy (or synonymy) is avoided in word-formation (e.g. Lieber 2004: 161, Lindsay & Aronoff 2013), it should be legitimate to state without speculation that these Latinate patterns have the potential to create synchronically observable semantic differentiation. Thus, for example, we can observe that the meaning of *construct*$_N$ is more specialized than the semantics of the polysemous noun *construction* (cf. (7) in section 2) and that it lacks the prototypical event reading productively displayed by the *-ion* nominal. Significantly, *construct*$_N$ differs from *construction* (in its referential reading) in that it denotes the result of a mental process rather than a material structure such as a building or a work of art. According to the OED,

[23] A recent diachronic account of the polysemy displayed by English action and agentive nominalizations, which is concerned with the influence of structural information and usage on the development of meaning components, has been provided by Bauer (2024).

it primarily refers to a concept, idea or belief formed on the basis of (subjective) experience, perception, impressions, or collective views. Hence its occurrence in phrases like *a social/political/cultural construct*. The pattern {construct}$_{V}$: {construction}$_{N}$ is in complementary distribution with the pattern {construe}$_{V}$: {construal}$_{N}$. While *construction* in its 'Product/Inanimate Patient' reading denotes an effected object, *construal* – if followed by an *of*-PP – has an elaborating function. The following sentences from enTenTen21 illustrate this point.

(39) a. He concludes that "a Thomistic *construal* of natural law requires maintaining a stronger distinction between nature and grace than de Lubac's collapsing of this distinction tends to allow […]."

b. Last, joy is complex in that it coparticipates in the social *construal* of reality.

c. Yet, this text challenges all such *construal* of the world in terms of our own efforts or in terms of our own ambitions apart from God.

As in phrases like *visualizations of known genes*, *a Stratford production of Christopher Marlowe's "Tamburlaine the Great"*, or *new interpretations of historical documents* (cf. (37) in section 3.2.3), the NP complements *natural law* (39a), *reality* (39b) and *the world* (39c) of the preposition *of* are not created, but exist independently of the event denoted by the nominalization. They are merely subject to human interpretation (and hence elaboration) at a highly abstract level. This kind of elaboration is not conveyed by *construction*.

Furthermore, consider the triplet {produce}$_{V}$: {produce}$_{N}$: {product}$_{N}$. Interestingly, the noun *produce* originally conveyed the event reading "the action or fact of producing; production *of* something specified", which according to the OED is now rare. Due to meaning specification, it now mainly refers to agricultural and natural products, e.g. *Even so, remember that you need to handle anything organic – meat, poultry, produce – the same as nonorganic* […]; (Gigaword). In this mass reading, it contrasts with the count noun {product}$_{N}$, which is rather associated with manufactured goods. While {product}$_{N}$ instantiates the 'Concrete-Entity' reading at the OBJECT pole of the Scale of Reification (i.e. Product ('effected object')), the meaning of its competitor {produce}$_{N}$, which allows for quantification (e.g. *Spinach and virtually all produce is vulnerable to contamination in many ways*; Gigaword), is located near the SUBSTANCE pole ('Quantity' reading). The

identification of generalizations which go beyond these "micro-level" observations must be left to future research.

Nevertheless, it should be possible – at least to some extent – to integrate the findings on *-ion* derivatives into the overall picture of English nominalization. To begin with, the suffix *-ion* is in competition with the suffix *-ing*, the far less productive suffixes *-ment*, *-al*, *-ance*/*-ence*, and *-ure*, which only occasionally surface in novel nouns (cf. Bauer, Lieber & Plag 2013: 199–200), and deverbal conversion. As pointed out by these authors, all English verbs (except auxiliaries) have nominal forms in *-ing*, whose semantics is "more active and typically less lexicalized" than the semantics of other types of nominalization (2013: 202). Moreover, as far as the non-native competitors *-(at)ion*, *-ment*, *-al*, *-ance*/*-ence* and *-ure* are concerned, "only *-ation* displays a substantial degree of productivity in contemporary English." (Bauer, Lieber & Plag 2013: 196) While all noun-forming devices of English have the potential to create event readings (cf. Lieber 2016: 36–37), a tentative hypothesis is that the *-ing* and *-ion* nominals share a relatively high disposition towards the reactivation of the backgrounded relations and phases which define the underlying events, whereas contextually induced interpretations displaying higher degrees of reification are tolerated. In other words, the nouns displaying these suffixes prototypically function to convey (moderately reified) event readings which may be contextually overridden by other readings represented on the Scale of Reification.[24] Conversely, derivatives displaying the less productive suffixes *-ment*, *-al*, *-ance*/*-ence*, and *-ure* inherently imply a higher (or high) degree of reification and hence prompt summary scanning in a stricter sense (cf. Fig. 1 in section 2). In this case, it is the contextually generated event reading that is tolerated by the suffixes at least to a certain extent. As far as *-ing* derivatives are concerned, this hypothesis is supported by Lieber & Plag's data-driven analyses according to which "there is a clear tendency for *-ing* nominalizations to express eventive readings, but referential readings are possible as well." (Lieber & Plag 2022: 309) Correlations between deverbal conversion nouns and event/referential readings are not immediately obvious. The quantitative analyses performed by Lieber & Plag (2022: 321–322) have shown that

[24] For example, sentences from enTenTen21 show that further possible meaning components of *-ing* comprise 'Generic Concept' (e.g. *unforced breaking*), 'Result State' (e.g. *blessing*, *blocking*), 'Quantity' (e.g. *all the destroying*), 'Instance(s) of' (e.g. *frequent meetings*, *constant warnings*), or 'Concrete Entity' (e.g. *baking* (effected object), *reading* (elaboration), *turning* (location).

contrary to claims made in the literature, the event readings activated by the conversion nouns of their dataset slightly outnumber referential readings. On the one hand, this finding seems to be in conflict with the concise expression of the underlying events by conversion nouns (which intuitively suggests the atemporal, gestalt-like summary view). On the other hand, this result is less surprising if we recall the transpositional/non-transpositional distinction mentioned in section 3.2.3. If deverbal conversion nouns are transpositional, i.e. used in close relation to the verbal meaning (e.g. *control*$_{N}$, *attack*$_{N}$, *climb*$_{N}$, *fight*$_{N}$, etc.), the creation of event readings should be unproblematic. However, if these nouns are non-transpositional, the internal structure of their base verbs is suppressed and their meanings are strongly reified (e.g. *build*$_{N}$ "bodily shape or physique", *look* "appearance, style", *lift* "elevator", *cut*$_{N}$ "a piece or slice of meat").

Of course, a certain degree of semantic overlap between the word-formation patterns sketched above, which cannot be further pursued in the present study, should be expected.[25] Moreover, it should be re-emphasized at this point that whenever the event reading located at the centre of the Scale of Reification is activated, the nominal follows its verbal base with respect to complement realization and null instantiation of the complement. The following sample of sentences from enTenTen21 whose derivatives go beyond *-ion* nominalizations illustrates this point.[26]

(40) a. Never mind the almost 24/7 *smoking* and *drinking*, but the intentional *destroying* *(of friendships) and the vicious ways he fought his "enemies" – going for the jugular and their destruction. [INI for *smoking* and *drinking*; no null instantiation for *destroying*]

b. This can be, for example, the intentional *breaking* *(of window glass).

c. I think the constant *renewal* *(of individual interests) is important in the field of electron device research.

d. The degree to which a warrior foregoes peeling a sand flea before he eats it, therefore, signals the warrior's "kiete bukazd," or "robustness." Following the successful *devouring*, he may yell out "euliemomgi," or "dominance!" [DNI]

e. Given the content of the epigram, it is unlikely to have been an accidental placement but was instead the intentional *placement* by an editor. [DNI]

[25] For a detailed analysis of the 'ecology' of English nouns, the reader is referred to Lieber (2016). Morphological, phonological and semantic properties of English nominalizations are discussed by Bauer, Lieber & Plag (2013: 195–215).

[26] In (40a) – (40c), the asterisk and the parentheses, which signal non-omissibility of the complement, were inserted by the author of this article.

f. ISW can assist you in the day-to-day *maintenance* of your website, even if someone else did the original *development* and *implementation*. [complement of *maintenance* shared by *development* and *implementation*; DNI]

Finally, recall that according to Radden & Dirven (2007), reification of situations is not restricted to nouns derived from verbs. Nouns denoting reified episodic or steady situations include for example simplexes like *idea*, *pain* (episodic situations) or *war*, *peace* (steady situations). Thus, the paradigmatically organized Scale of Reification also allows us to account for the 'event-like' properties of nouns such as *trip* or *race* (e.g. Grimshaw 1990: 58f) because their episodic readings are located immediately to the right of the 'Prototypical-Event' position. In this position, they pattern with deverbal nouns like *examination* (in a phrase like *repeated examinations*) or *assignment* (in a phrase like *that assignment*). Similarly, the meaning of the non-deverbal noun *autopsy* patterns with the 'Prototypical-Event' reading of *examination* and other deverbal nouns in a sentence like *A team of engineers and forensic analysts on Tuesday launched a high-profile autopsy of the blowout preventer from the Deepwater Horizon* (Gigaword). Thus, the Scale of Reification helps us not only to systematize the multiple readings of the *-ion* derivatives under consideration and possibly of other deverbal nouns, but also accommodates event-like readings of nouns which lack a verbal base (e.g. *autopsy*, *trip*).

Moreover, like verbs and their derived nominals, these nouns evoke frames in the sense of Fillmore's Frame Semantics. While frames help to fill in missing information if the derived nominal – like its verbal base – allows for Indefinite Null Instantiation, they also provide configurations of Frame Elements (FEs) for non-deverbal nouns which can be paired with valence patterns. For example, according to FrameNet, nouns like *trip*, *journey*, *voyage*, *tour*, or *safari* evoke the 'Travel' frame which specifies 'Traveler', 'Area', 'Direction', 'Source', 'Path', 'Goal' and 'Mode_of_transporation' as core FEs. Further components of the frame, such as 'Distance', 'Duration', 'Manner', or 'Speed', are optional and hence constitute non-core FEs. Since frame-element configurations correspond with valence patterns in which each active FE is associated with a phrase type and a grammatical function (cf. for example Fillmore et al. 2003, Fillmore & Baker 2009, Boas 2021), frame information is well-suited to account for event-like readings of simplex nouns which as such lack an underlying verbal argument structure.

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