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Eventualities in the semantics of denominal nominalizations

Abstract: This paper deals with eventuality-related, denominal nominalizations. The term ‘eventuality-related nominalizations’ refers to nominalizations in which an eventuality plays a central role for the interpretation of the derivative. This paper will argue that a nominalizing affix requires an eventuality or a participant of an eventuality from the semantic representation of the base word. For deverbal nominalizations, the required eventive elements are straightforwardly available as verbs are typically eventive in nature. However, concerning nominal bases, the semantic representation of the base word is in many cases not straightforwardly eventive. This study aims at finding the required eventive structures for the nominalizing suffix *-ee* in nominal base words. In order to do so, data for denominal derivatives with the suffix *-ee* from previous research on the suffix are used and analyzed using a frame semantic approach. It can be observed that it is indeed possible to reveal eventive structures in nominal bases which are accessible for the process of nominalization.

Keywords: nominalization, semantics, suffix *-ee*, semantic representation, frame semantics

1 Introduction

Many English nominalizing suffixes, such as *-ation*, *-ee* or *-ment*, give rise to derivatives that denote either eventualities¹ or participants of eventualities. In this paper, such derivatives are called EVENTUALITY-RELATED. The examples in (1) and (2) illustrate that the base words denote eventualities which are, in both examples, central for the meaning of the derivatives.

¹ The term ‘eventuality’ includes events, processes and states. For a fine-grained distinction of the different types of eventualities see, for example, Bach (1986), Van Valin and LaPolla (2002).

- (1) *Salary and bonus information for every **employee**.* (COCA; see Davies 2008; BLOG, 2012)

In (1), the derivative *employee* denotes a participant of the *employing-eventuality* denoted by the base *employ* as an employee is a person who is employed by someone.

In (2), on the other hand, the derivative with the suffix *-ment* denotes the whole eventuality denoted by the base to form the meaning of *befoulment*.

- (2) *Markham sets down the rules about park **befoulment**.* (Plag et al. 2018: 474)

In general, eventuality-related nominalizations, as the examples in (1) and (2), denote either a (sub-)eventuality or a participant of an eventuality. The category of eventuality-relatedness is a rather broad category as several more fine-grained classes, which are to be found in the literature, such as, for example, participant, result, or eventive readings, are merged together in this umbrella term (see Lieber 2017 for an overview of the several diverging classification systems for the semantic categorization of nominalizations).

Research on nominalizations observed that such eventuality-related readings arise systematically from eventualities denoted by the base (see, e.g., Bauer et al. 2013: 213, Plag et al. 2018, Kawaletz 2021). There is an implicit consensus that suffixes which lead to eventuality-related readings prefer verbal bases because of the strong association of verbs and eventuality semantics (see, e.g., Haspelmath 2001, Van Valin and LaPolla 2002, Szabó 2015, Moltmann 2019 on the preferential concurrence of word classes and ontological categories). Due to this strong link between verbs and eventualities, studies on eventuality-related nominalizations tend to focus on verbal bases (see, e.g., Grimshaw 1990, Alexiadou 2001, Lieber 2016, Plag et al. 2018; for overview articles with the same bias, see Alexiadou 2010, Lieber 2017).

However, such a narrow focus on only one possible word class of the base for a word-formation process is problematic. First, in English, the word class of a base is oftentimes not unambiguously identifiable. Determining the directionality of conversion poses a notoriously difficult problem for the identification of the word class of a base (see, e.g., Balteiro 2007, Bram 2011, Plag 2018: 87, see also Barbu Mititelu et al. 2023). Second, less ambiguous cases indicate that the majority of English word-formation processes operate on more than one word class (see, e.g., Plag 1999, 2004, 2018: 87, Bauer et al. 2013: ch. 10). Several authors suggest that it is the semantics of a word-formation process that determines potential bases regarding semantic compatibility of word-formation process and base. Conversely, the word class of the typical base of a process

should be understood as an epiphenomenon of this word class's typical semantics (in particular Plag 2004; see also Barker 1998, Bauer et al. 2013). This also holds for nominalizations that produce eventuality-related readings on bases other than verbs. Some clearly denominal examples are given in (3).

- (3) a. *ozonation, sedimentation*
 b. *biographee, debtee*

The problem which arises for a semantic account of the word-formation process with eventuality-related nominalizations is that nouns usually do not denote eventualities, in contrast to verbs (Haspelmath 2001, Van Valin and LaPolla 2002, Szabó 2015, Moltmann 2019). Nevertheless, nominalizations based on non-deverbal bases also produce eventuality-related readings. For example, the bases for the derivatives in (3), like *sediment*, do not denote an eventuality, but the derivatives, like *sedimentation*, do. To the author's knowledge, to date there is no systematic study on denominal nominalizations with eventuality-related readings available (cf. Plag 2004). Since nominal bases, such as the noun *biography*, are not eventive, it remains unclear where the origin of the eventuality-related nature of the derivative lies.

Different approaches to nominalization semantics might suggest different solutions to the problems posed by examples such as those in (3). In syntactic approaches, such as Alexiadou (2001) or Borer (2013), dedicated functional projections are responsible for (sub-)eventive or participant readings. In lexicalist morpheme-based approaches, such as the framework of Lieber (2004, 2016), affixes come with a semantic representation of their own, for example, with feature specifications such as +DYNAMIC to mark eventive semantics. In word-based approaches, in contrast, affixes are not linguistic signs on their own, and it is only (abstractions of) complex words that have meaning (as, e.g., in Booij 2010, Koenig 1999). In this paper, a form of word-based morphology that has recently been employed successfully in the analysis of the semantics of deverbal English *-ment*-nominalization is followed (see Plag et al. 2018, Kawaletz 2021). In this approach, the semantic contribution of the suffix is modeled as its potential to induce referential shifts on the semantics of its base.

In this paper, I will extend Plag et al.'s (2018) and Kawaletz's (2021) reference shifting approach and show that denominal nominalizations are also dependent on eventualities in their respective bases. The focus here lies on denominal nominalizations with the suffix *-ee*. The examples in (4) illustrate further denominal derivatives with the suffix *-ee* mentioned in the literature (Barker 1998, Plag 2004, Mühleisen 2010).

- (4) *biographee, covenantee, festschriftee, mentee, tutee*

Previous research on eventuality-related nominalizations with the suffix *-ee* already illustrates that an eventuality in the base is essential to form the participant reading of the derivative (Barker 1998, Plag 2004). This assumption of the necessity of an eventuality in the base leads to the following question for the analysis of the word-formation process with nominal bases:

How can the semantic representation of nominal bases be modeled to reveal the eventive structures needed to induce the referential shift to create the meaning of the derivative?

In order to reveal the eventive structures in the nominal base, the semantic representation of the base needs to be decomposed. Frame semantics will be used to model the semantic structures of the derivatives and bases. In particular, the reference shifting approach suggested by Plag et al. (2018) and Kawaletz (2021) will be followed.

Some of the examples chosen in this paper might also have a verbal variant of the base. A frequency criterion was chosen to determine the word class of the base. The nominal base forms of the chosen examples for this study are by far more frequent than the verbal forms. This difference in frequency leads to the assumption that the nominal form is more likely chosen as the base for the nominalization than the verbal option (see, e.g., Plag 2018: ch. 3). Furthermore, new *-ee* formations are often based on *-er* formations (Bauer et al. 2013: ch. 23) which then may pose the same problem, e.g., *aggressor*, *mentor*, *executioner*.

The next section of this paper discusses the theoretical background. Section 3 gives exemplary frame semantic analyses of eventuality-related nominalizations with nominal bases and the suffix *-ee* for non-derived bases in 3.1 and paradigmatically related cases in 3.2. Section 4 evaluates the findings of these analyses and discusses implications for further work on eventuality-related, non-deverbal nominalizations.

2 Theoretical background

2.1 Eventuality-related nominalizations

Eventualities are complex semantic entities of which participants, like AGENTS and PATIENTS, are part of. Henceforth, the term ‘eventive elements’ will be used to refer to participants, eventualities, sub-eventualities and eventualities in the broader sense, including states. Theoretically, sub-eventualities, for example,

RESULT-STATES, can also be contained in the eventive structure of one eventuality. For the creation of the meaning of an eventuality-related nominalization, either the eventuality or one of its participants from the semantic representation of the base word is required. Table 1 illustrates possible derivatives based on the verb *employ*.

Tab. 1: Derivatives based on the verb *employ*.

derivative	eventive element
employer	agent
employee	patient
employment	eventuality

It can be observed that the nominalizations with the different nominalizing suffixes, *-er/-ee/-ment*, refer to different eventive elements from the eventuality denoted by the base. The eventive elements are inherited from the semantic representation of the base verb (Löbner 2013, Plag et al. 2018). The derivative with the suffix *-er* denotes the AGENT, and the derivative with the suffix *-ee* denotes the PATIENT of the *employing-action*.² The derivative with the suffix *-ment*, then, denotes the whole eventuality.

As illustrated, the derivational process of eventuality-related nominalizations is straightforward with verbs, as verbs are eventive in nature. Verbs denote eventualities which can be decomposed into several eventive elements that are relevant for the construal of the derivative’s semantics: The semantic representation of the verb *employ* in Table 1 consists of an eventuality and its participants. The word-formation process can refer to one of these eventive elements to create the meaning of the derivative.

Turning to nominal bases, nouns are not always as straightforwardly eventive as verbs. Especially nouns which denote concrete objects or artifacts seem not to be eventive at all. Nonetheless, it is possible to take a noun like *biography* as the base word for a nominalization to form the derivative *biographee*. The derivative shifts the references from the book or its content to a person, the person whose life is described. In order to achieve this change in meaning, a participant of an

² An alternative analysis would say that an *employee* is someone who is in a state of being employed. A detailed analysis of *employee* is beyond the scope of this paper. I use this derivative only for exemplification of my approach.

eventuality which fulfills the requirements of the word-formation process with the suffix *-ee* is needed. This referential shift is similar to the verbal process in the example derivative *employee* which denotes the PATIENT of the *employing-action*.

Nevertheless, although the referential shift from the object *biography* to a participant of an eventuality in the derivative *biographee* seems similar to the process with verbal bases, it is unclear where the eventuality with the required participant comes from. Thus, the process does not seem to be as straightforward with nominal bases compared to verbal bases. The problem has been mentioned rather vaguely in the literature:

“The verbal relation is implied by context or can be inferred from the nature of the non-verbal base. [...] Such interpretations follow from the sort of activities that the base nouns could conceivably be involved in.” (Bauer et al. 2013: 233)

It remains unclear if and where an eventuality in a nominal base is inherent in the semantic representation of the nominal base.

One approach that does incorporate eventualities in lexical entries in nouns is Pustejovsky’s Generative Lexicon (1996: ch. 6; for different approaches on eventualities in nouns see, e.g., Larson 1998, Winter and Zwarts 2012). For example, for the artifact noun *biography*, the approach by Pustejovsky would posit two eventualities in the lexical entry. In one eventuality, the artifact came into being as a result of the writing of the book (AGENTIVE-QUALE). The second eventuality is what Pustejovsky (1996: ch. 6) has labeled ‘qualia’ (more specific: TELIC-QUALE) and other people have called ‘affordance’ (see, e.g., Löbner 2013: 315). Affordances describe what artifacts are used for and they function as an integral part of the meaning of the noun. The second eventuality would thus describe the presumed usage of this book, that is, the reading of the book. Both eventualities relate to the idea by Bauer et al. (2013) that the base noun could be involved in an activity. The analysis by Pustejovsky does not go into detail about the eventive structures itself. For the purpose of this study, the eventualities in the nominal base need to be further decomposed as the word-formation with a nominalizing suffix can refer to a whole eventuality, an embedded sub-eventuality or a participant taking part in the eventuality. Hence, further decomposition of the eventuality is needed to identify the eventive element for the word-formation process. To achieve this necessary degree of decomposition of eventive structures, frame semantics is used to model the inherent structure of the nominal bases to clarify the referential shift from base to derivative. This will be explained in the following section.

2.2 Semantic frames

The semantic frames used in this study are based on Barsalou’s (1992b, 1992a) theory of cognitive frames. The general idea behind semantic frames is that meanings are concepts, and that such concepts in human cognition are stored as ‘frames’ (Petersen 2007, Löbner 2013, 2014, Gamerschlag et al. 2014). Research on deverbal nominalizations has shown that frame semantics is a useful tool to analyze the semantic representation of a base word and its derivative in a unified format (e.g., Kawaletz and Plag 2015, Plag et al. 2018, Kawaletz 2021).

The central building block of frames are attribute and value structures as known from other frameworks (e.g., HPSG, Pollard and Sag 1994). Attributes describe a concept and each attribute then takes a specific value (Löbner 2013: 303). For example, the sentence *John employed Paul* describes an employing-eventuality that is specified for the attributes AGENT with the value *John* and PATIENT with the value *Paul*. The semantic representation of the verb *employ* can be depicted in an attribute-value-matrix (AVM) as in Figure 1:

$$\begin{array}{c} \boxed{0} \left[\begin{array}{l} \textit{employing-action} \\ \text{AGENT } \boxed{1} \textit{ John} \\ \text{PATIENT } \boxed{2} \textit{ Paul} \end{array} \right] \\ \text{REF} = \boxed{0} \end{array}$$

Fig. 1: Exemplary AVM for the verb *employ*.

The AVM describes an *employing-action* as the semantic representation of the verb *employ*. The action is specified for two attributes, an AGENT and a PATIENT. These two attributes are further specified with the values *John* and *Paul*. The numbers in the AVM are indices which serve as labels for and reference to the elements in the frame. The index $\boxed{0}$ labels the *employing-action*, the index $\boxed{1}$ labels the AGENT, and the index $\boxed{2}$ labels the PATIENT. Reference of the lexeme is specified by the REFERENCE-attribute (REF). For the lexeme *employ*, reference is on the whole event, i.e., on node $\boxed{0}$. Frames are recursive, as a value can have further attributes which then have further values (Löbner 2013: 307).

Moving on to the description of participant-denoting derivatives in semantic frames, a shift of reference is necessary from the action itself to a specific participant in the eventuality denoted by the base. This referential shift of the base word to the derivative is indicated in the REFERENCE-attribute (REF) in

the semantic frame (Plag et al. 2018, Kawaletz 2021). Figure 2 depicts an AVM for the derivative *employer*.

$$\begin{array}{c} \boxed{0} \left[\begin{array}{l} \textit{employing-action} \\ \text{AGENT } \boxed{1} \textit{John} \\ \text{PATIENT } \boxed{2} \textit{Paul} \end{array} \right] \\ \text{REF}=\boxed{1} \end{array}$$

Fig. 2: Exemplary AVM for the derivative *employer*.

In order to form the derivative *employer* from the base verb *employ*, the reference shifts from the *employing-action* indexed with $\boxed{0}$ to the AGENT-attribute indexed with $\boxed{1}$. Hence, the meaning of the derivative describes the AGENT of the *employing-action*, *John*, and not the whole action of the verb *employ*. The derivative *employee*, on the other hand, would shift the reference of the base to the PATIENT-attribute *Paul* indexed with $\boxed{2}$.

2.3 Restrictions on the suffix *-ee*

Before the formalization of the base and the derivative will be described in detail, an explanation on what is already known about the restrictions for the suffix *-ee* in general is needed. Phonetically, the suffix *-ee* is autostressed (e.g., Plag 2018: 89). Verbal bases are frequent and nominal bases are not uncommon for formations with the suffix *-ee*. Looking at the semantics, the meaning of a derivative with the suffix *-ee* is rather clearly discernable. The denoted participant follows three known restrictions. First, the derived noun denotes a sentient participant of an eventuality. For example, the PATIENT in the *employing-action* (see, e.g., Table 1) is necessarily a sentient being. The sentience constraint is an important semantic requirement for derivatives ending in the suffix *-ee*, but it can be violated in domain-specific terminology (Barker 1998: 710).

Second, another known restriction for the word-formation process with the suffix *-ee* is the necessity of an eventuality in the base. Barker (1998) calls this constraint “episodic linking”:

“The intuition behind episodic linking is very simple: the referent of a noun phrase headed by an *-ee* noun must have participated in an event of the type corresponding to the stem verb. For example, in order to qualify as a *gazeer* it is necessary to participate

in a certain role in a gazing event. This requirement is a crucial part of explaining how the meaning of an *-ee* noun can depend on the meaning of its stem without depending on the syntactic argument structure associated with the stem.” (Barker 1998: 711)

The necessity of episodic linking shows that eventualities and their participants are indispensable for the creation of the meaning of the derivative with the suffix *-ee*. More specifically, the derivative denotes a participant of the base’s eventuality. Due to the other requirements of the word-formation process with *-ee*, not all participants involved in the eventuality in the base word are possible candidates for the word-formation process. The same restrictions hold for denominal *-ee* derivatives (Barker 1998, Plag 2004).

Third, the participant denoted by the suffix *-ee* is restricted by a lack of volitionality. Hence, the participant which is described by the derivative must be non-volitional. This lack of volitionality is usually defined as the lack of control the *-ee* participant has over an eventuality. The lack of volitional control is not an absolute property but rather up to a certain degree, in contrast to the sentence requirement or the episodic linking (Barker 1998: 719). More precisely, a participant does not have to be completely non-volitional but rather more non-volitional than other possible targets for the suffix *-ee*. For instance, a PATIENT is less volitional than an AGENT. As a consequence, exceptions to the volitionality constraint can be found. For example, *escapee* denotes the AGENT of the *escaping-action*. This violation is possible for *-ee* derivatives with bases that are either intransitive verbs or verbs that can be interpreted as having a non-volitional subject participant (Barker 1998: 719f.). For new formations with the suffix *-ee*, the volitionality constraint is expected to be satisfied.

As mentioned previously, nominalizations with the suffix *-ee* are attested for nominal bases. The list in (5) illustrates some *-ee* nominalizations with a nominal base. Note that this list is not exhaustive.

(5) Non-deverbal *-ee* derivatives (Barker 1998, Plag 2004, Mühleisen 2010)

<i>agressee</i>	<i>asylee</i>	<i>bargee</i>	<i>benefactee</i>
<i>biographee</i>	<i>blind datee</i>	<i>covenantee</i>	<i>custodee</i>
<i>debtee</i>	<i>executionee</i>	<i>festschriftee</i>	<i>inquisitee</i>
<i>laryngectomee</i>	<i>letteree</i>	<i>malefactee</i>	
<i>mentee</i>	<i>moneylendee</i>	<i>optionee</i>	
<i>patentee</i>	<i>philanthropee</i>	<i>politicee</i>	
<i>return adresee</i>	<i>tutee</i>	<i>wardee</i>	

Summarizing, previous research has established three restrictions for nominalizations with the suffix *-ee*, which hold for all kinds of bases (Barker 1998, Plag 2004):

- the meaning of the derivative is a participant involved in an eventuality in the base word
- the participant must be sentient (sentience requirement)
- the participant lacks volitional control with some exceptions, for example, intransitive verbs (non-volitionality constraint)

This paper focuses on two types of denominal nominalizations. First, the denominal derivatives *debtee*, *biographee* and *covenantee* will be analyzed to illustrate the word-formation process with non-derived bases in section 3.1.

Second, section 3.2 illustrates the word-formation process with bases that appear to be derived, like *tutor* or *mentor*. These bases look as if they are already derived with the suffix *-or/-er*. However, they are loan words either from French or Latin. The suffix *-ee* replaces the suffix *-er/-or* to refer to a different participant from the eventuality given by the loan word.

3 Frame formalization

In Figure 3, a frame representation of the derivational process with the suffix *-ee* is shown. It includes the constraints given by Barker (1998)(see section 2.3). The frame illustrates which elements are needed in the semantic representation of the base to successfully form a nominalization with the suffix *-ee*. Part of this descriptive generalization is an eventuality in the base. This eventuality then includes a participant which, in turn, is referred to by the derivative.

The type *lexeme* at the top of the frame stands for the derivative and base under investigation. This derivative has the phonological form³ (PHON) of the base *x* and the suffix *-ee*. The derivative has the syntactic category noun (CAT N). The attribute M-BASE describes the morphological base of the derivative. The base is also a *lexeme* which has a phonological representation (PHON) and is also a noun (CAT N) indicating that we are dealing with a denominal derivative.

3 The phonological form given in Figure 3 is only short-hand for a more complex representation that would have to include, for instance, the necessary adjustments in stress. As this paper focuses on semantics, the phonology of *-ee* derivatives is not described in detail (see, e.g., Bauer et al. 2013: 227).

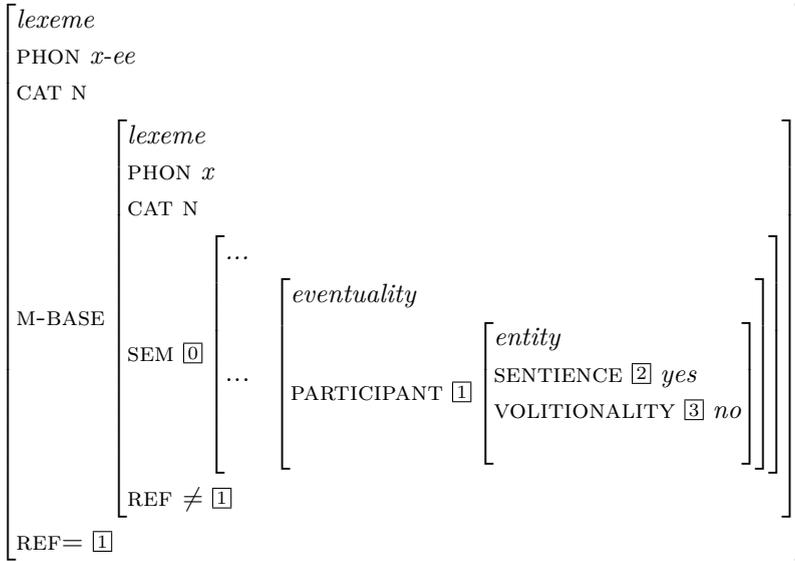


Fig. 3: Generalized derivational process for denominal *-ee* nominalizations.

Additionally, the base contains a semantic attribute (SEM) which illustrates the semantics of the base. In order to successfully derive an *-ee* nominalization, the semantic representation of the base needs to contain an *eventuality*. Importantly, the base word does not have to consist of this eventuality directly in the node indexed with [0], but the eventuality can be more deeply embedded in the semantic representation of the base word. This potential embedding is represented by the three dots (...) in SEM [0] which serve as placeholders for a potentially different semantic type of the base. Moreover, this eventuality in the base needs to have one PARTICIPANT such as the one indexed with [1]. The PARTICIPANT is an *entity* which has to be sentient and non-volitional. The SENTIENCE-attribute indexed with [2] has the value *yes* for indicating that the entity is sentient. The VOLITIONALITY-attribute indexed with [3] has the value *no*, thus indicating that the entity described is non-volitional. The PARTICIPANT indexed with [1] meets the restrictions of the suffix *-ee* described in section 2.3 and is hence required for the referential shift to create the meaning of the *-ee* nominalization.

At the bottom of the representation of the base and the derivative, the potential referents of the lexemes are indicated by a REFERENCE-attribute (REF) for each lexeme. The reference of the base word is not fixed in the rule with the exception that it cannot refer to the PARTICIPANT indexed with [1]. The reference

of the derivative, however, is the node indexed with \square , as the reference shifts towards the PARTICIPANT.

The frame in Figure 3 is the template for the frame representations of the individual words in the remainder of this section. The analysis will show that the derivational process is not always as straightforward as assumed in the generalized frame.

For the semantic decomposition of the individual bases, the definitions of the base words in the *Oxford English Dictionary* (OED, 2021) were used as a starting point. This source was chosen as it is based on solid empirical evidence (i.e., actual attestations). The entries are accessible for verification and provide paraphrases detailed enough to derive semantic descriptions from. The usage of derivatives is illustrated with attestations from the *Corpus of Contemporary American English* (COCA, Davies 2008) and the *British National Corpus* (BNC, Davies 2004).

3.1 -ee nominalizations with non-derived bases

3.1.1 *debtee*

The first derivative under investigation is *debtee*. Its base word is the noun *debt*. A *debtee* denotes a person as illustrated in (6):

- (6) *The “debtee” is an old word for the creditor or payee.* (BNC; see Davies 2004; ACAD, 1992)

As indicated in the definition in (6), the *debtee* has an eventuality-related interpretation as it denotes an entity to whom the money is owed. This eventuality suggests a potential *paying-eventuality*. More precisely, the *debtee* can be construed as the recipient in a future money transfer eventuality. Since *debtee* denotes a participant in an eventuality, the assumption is that the eventuality to induce the referential shift of the derivative is in the semantic representation of the base word *debt*. This assumption leads to the question where the eventuality and the required participant for the word-formation process with *-ee* is to be found in the nominal base. The paraphrases in the OED (2021) already provide a clue for the eventuality in the semantic representation of the base word *debt*:

1. *That which is owed or due: a sum of money or a material thing; a thing immaterial.*
2. *A liability or obligation to pay or render something; the condition of being under such obligation.*

In the second definition, *debt* is defined as an obligation. Semantically, obligations can be analyzed as states, i.e., non-dynamic eventualities with at least one participant. I will refer to this eventuality as an obligation-state. This link leads to the representation of base and derivative in the frame in Figure 4. The derivative has a phonological representation (PHON) and the syntactic category noun (CAT N). The base (M-BASE) *debt* is also a noun.

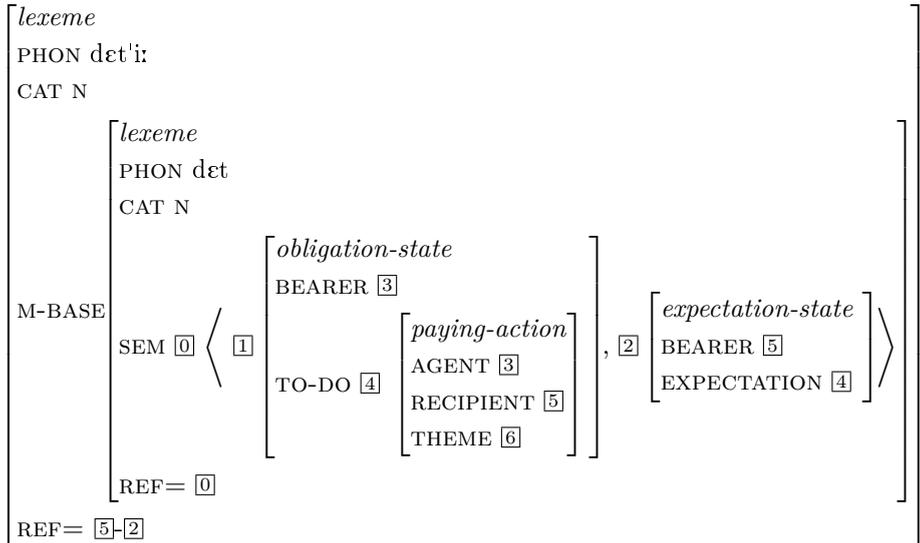


Fig. 4: Representation of the lexeme *debtee*.

The semantics of the base (SEM) is depicted as a so-called multi-AVM and consists of two frames with different source nodes, indexed with [1] and [2]. Both AVMs illustrate states, an *obligation-state* ([1]) and an *expectation-state* ([2]). First, the *obligation-state* has two attributes; a BEARER⁴ of the state, indexed with [3], and an attribute TO-DO, indexed with [4]. The attribute TO-DO specifies what the BEARER has to do in order to fulfill their obligation. The TO-DO attribute has the

⁴ The label BEARER is only one option to name the participant in a state. Different notations for the participant in a state are known (see, e.g., Van Valin and LaPolla 2002). The label of the participant does not play a crucial role for the analysis provided in this paper, as long as this participant role fulfills the sentience and volitionality restrictions of *-ee* in pertinent cases.

value *paying-action*, which is a sub-eventuality in the semantic representation of the base *debt*. This *paying-action* has at least three attributes; an AGENT indexed with [3], a RECIPIENT indexed with [5] and a THEME indexed with [6]. The indices indicate that the BEARER of the *obligation-state* is the same person as the AGENT of the *paying-action* indicated by [3]. The BEARER in the *obligation-state* is the one who has to pay.

The second state in the base is an *expectation-state* which describes the circumstance that the *paying-action* ([4]) has not been finished. The *debtee* expects to get their money back. The *expectation-state* has at least two attributes, a BEARER indexed with [5] and an EXPECTATION indexed with [4]. Note that the BEARER of the *expectation-state* is co-indexed with the RECIPIENT of the *paying-action* ([5]) and the EXPECTATION is co-indexed with the whole *paying-action* ([4]).

Moving on to the process of derivation, the question of how the word-formation process with *-ee* knows which node to pick as the reference node (REF) arises. The restrictions for nominalizations with the suffix *-ee* state that the referent has to be sentient and non-volitional (see section 2.3). In the semantic representation of the base *debt*, two possible targets for the shift of reference are present, the BEARER of the *obligation-state* and the BEARER of the *expectation-state*, as BEARERS are sentient and non-volitional. The participant indexed with [3] is not only a BEARER of the *obligation-state* but also an AGENT in the embedded eventuality, the *paying-action*. Hence, the participant in [3] is not only a non-volitional participant as a BEARER in the *obligation-state* but also a volitional participant, an AGENT in the *paying-action*. The BEARER of the *expectation-state*, on the other hand, is co-indexed with the RECIPIENT of the *paying-action*. As the BEARER of the *obligation-state* is co-indexed with the AGENT of the *paying-action*, it is more likely for the derivative to refer to the BEARER of the *expectation-state*. The entity indexed with [5] is only represented as a non-volitional participant. According to the volitionality constraint, the more non-volitional participant is chosen as a referent for the word-formation process if two possible targets exist. Hence, [5] is the reference node for the interpretation of *debtee*. Note that the derivative does refer to the element indexed with [5] in the *expectation-state* [2] as the payment of the *paying-action* has not been completed.

The frame for *debtee* illustrates that nominal bases can be eventive themselves. Accordingly, an eventuality can exist in the semantic representation of a nominal base. The eventuality and its participants provide possible targets for the word-formation process.

3.1.2 *biographee*

As shown in 3.1.1, the derivational process of *-ee* derivatives with nominal bases can be rather straightforward in the case of eventive bases. However, what happens if a base is not clearly eventive? This will be illustrated by the derivative *biographee*. The examples in (7) illustrate the use of this derivative:

- (7) a. [...] version of the Petraeus biography, whose biographer is admitted to have lain with the **biographee** in the Biblical sense. (COCA, BLOG, 2012)
- b. [...] who noted that ‘politicians are happiest when talking, at their most miserable when making up their minds.’ His **biographee** would dissent (BNC, MAG, 1985-1994)

The base for the derivative is the noun *biography*. The base noun is not clearly eventive as it denotes, among other things, an object. As Pustejovsky (1996: ch. 8) already pointed out, artifacts, like *books*, also serve as objects which contain information. Such objects which can be of two different types are so called ‘dot-objects’. *Books*, for example, can be described as physical objects and as containing information at the same time. This also applies to the specific type of book, *biography*, which is not only a concrete object but also a thing that contains information. This information concerns the life of a person and the derivative *biographee* denotes this person. The referential target of the suffix *-ee* is the person about whose life a book is written.

Moreover, a *biography* has to come into being and it is used for a specific purpose. These two processes are eventualities that are part of the semantic representation of the base word *biography*. These different aspects of the meaning of the base *biography* and the derivative *biographee* are represented in Figure 5.

The semantic representation of the base *biography* is more intricate than that of *debtee*. The base noun *biography* is labeled as a *text* in the semantic representation as the frame for the base illustrates *biography* as an information object. This *text* has the attributes PRODUCTION indexed with [1], AFFORDANCE indexed with [2], and TOPIC indexed with [4]. The structure in the base is based on Pustejovsky (1996: ch. 6). This illustration of the base shows which elements can be assumed in a nominal base in general. A look at the properties of the participants in these eventualities will show which of them are compatible with the suffix *-ee*. The PRODUCTION-attribute is analogous to the AGENTIVE-QUALE in Pustejovsky, and the AFFORDANCE-attribute is analogous to the TELIC-QUALE in Pustejovsky. Hence, a biography is a *text* about something (TOPIC)

which is produced by someone (PRODUCTION/AGENTIVE) for a special purpose (AFFORDANCE/TELIC).

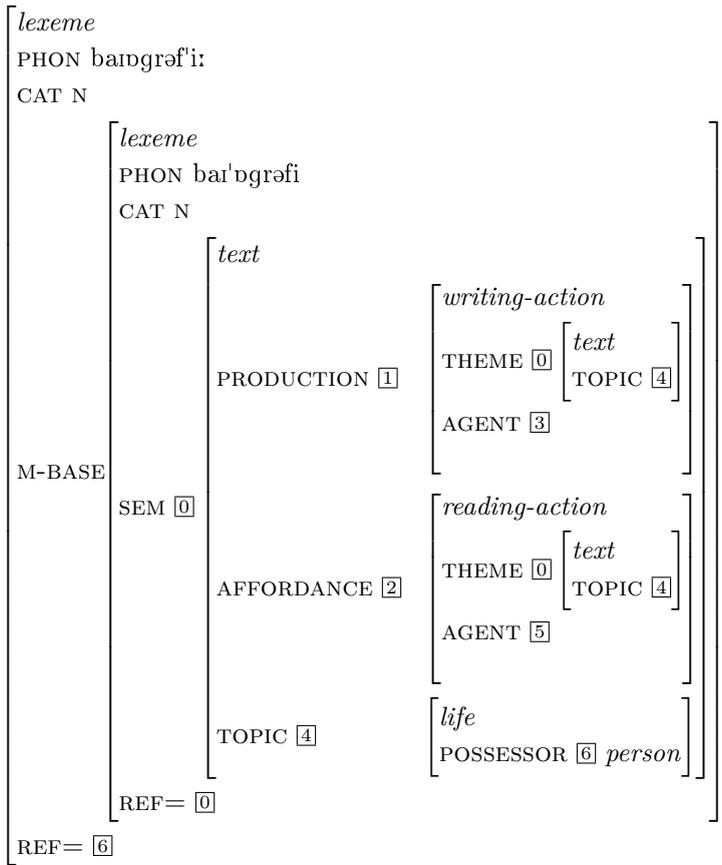


Fig. 5: Representation of the lexeme *biographee*.

The PRODUCTION-attribute and the AFFORDANCE-attribute have eventualities as their value. The PRODUCTION is a *writing-action* and the AFFORDANCE is a *reading-action*. Both eventualities contain an AGENT; in the *writing-action* the agent is the writer of the text and in the *reading-action* the agent is the reader of the text. The two AGENT-attributes refer to different persons and

are therefore given different index-numbers ([3], [5]).⁵ In contrast, the THEME-attributes (indexed with [0]) represented in both eventualities refer to the same entity, namely the *text* itself, which is the referent of *biography*. This THEME contains the TOPIC-attribute indexed with [4].

Finally, in order to account for the specific genre of text instantiated by *biography*, the topic-attribute is typed *life*. In turn, the type *life* has a POSSESSOR,⁶ indexed with [6], which is a person.

The REFERENCE-attribute is specified for an element with the required semantics to form the meaning of the derivative *biographee*. The reference is on the element indexed with [6], the POSSESSOR. Of the seven different nodes in this frame, only this one adheres to the restrictions posed by -ee. All other nodes are either volitional (AGENT: [3], [5]) or non-sentient (THEME [0], PRODUCTION [1], AFFORDANCE [2], TOPIC [4]). Thus, the aforementioned restrictions on derivatives with the suffix -ee successfully narrow down which part of the base's semantic structure can be used as reference for the derivative.

3.1.3 *covenantee*

The next derivative analyzed in this paper is *covenantee* as in example (8). The base is the noun *covenant*.

- (8) a. It was argued on behalf of the respondents that the doctrine applied to a covenant which was imposed for the benefit of the trade of the **covenantee** and which either forbids the covenantor to carry on his trade or restricts the way in which he may carry it on. (BNC, ACAD, 1991)
- b. However, even if the **covenantee** would not have entered the agreement without the covenant, the contract may not be invalidated as a whole [...]. (BNC, ACAD, 1991)

According to the definition from the OED, a covenant is “a mutual agreement between two or more persons to do or refrain from doing certain acts”. The derivative *covenantee* denotes a person who is under an obligation to fulfill

⁵ The frame-format does not prohibit co-indexation of these two elements. The writer can read their own work as well. The non-co-indexed version is probably the more natural one.

⁶ The label POSSESSOR is only one option to name the participant in [4]. Other analyses for this participant might be available. The label of the participant does not play a crucial role for the analysis provided in this paper.

such an agreement, regardless of whether the agreement authorizes or prohibits something. Interestingly, *covenantee* can refer to two entities, namely to both parties that are involved in the covenant. This is opposed to *debtee* and *biographee*, for which only one possible referent can be identified. Figure 6 illustrates the frame for *covenantee*.

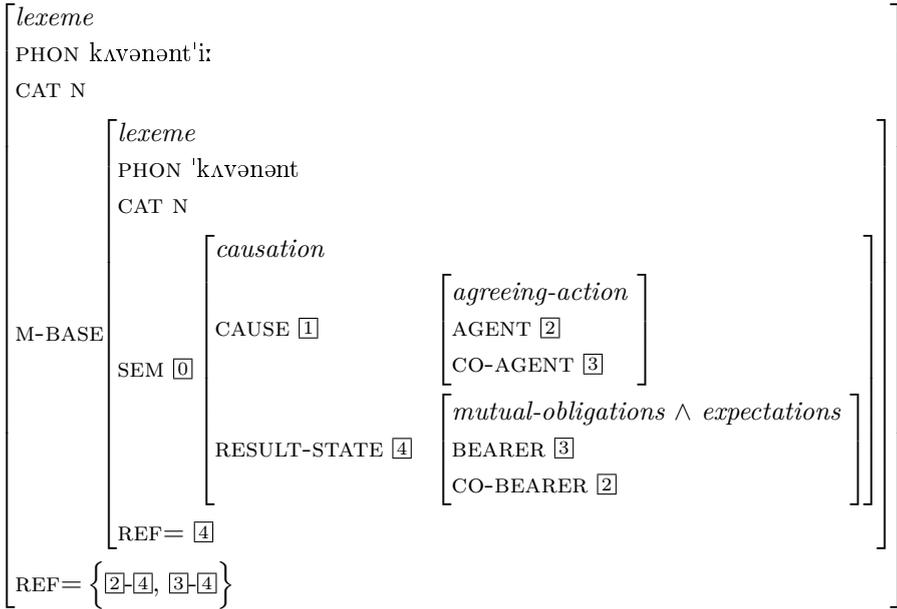


Fig. 6: Representation of the lexeme *covenantee*.

Focusing on the representation of the base, a *covenant* is a different type of obligation than the one in the base *debt* described above (see section 3.1.1). The obligations denoted by a *covenant* are *mutual-obligations* and *expectations*. These *mutual-obligations* and *expectations* are analyzed as a state in [4], which is a sub-eventuality that results from a *causation*-eventuality. The *causation*-eventuality consists of a CAUSE, which is an *agreeing-action* and a RESULT-STATE. The *agreeing-action* has at least two attributes, an AGENT indexed with [2], a CO-AGENT indexed with [3]. Two agents are realized as the agreement on the *covenant* as the RESULT-STATE is made by two parties. These parties can be on equal level as assumed in the frame notation. The RESULT-STATE has at least

two attributes, a BEARER indexed with [2], and a CO-BEARER indexed with [1]. The two BEARERS are co-indexed with the two AGENTS in the *agreeing-action*.

In this representation, two possible targets for the suffix *-ee* are available as two non-volitional sentient beings are represented in the RESULT-STATE of the base, the BEARER [3] and the CO-BEARER [2]. The REFERENCE-attribute (REF) shows that the meaning of the derivative *covenantee* can either be on the element indexed with [2] or [3] in the RESULT-STATE [4] ([2]-[4], [3]-[4]). Interestingly, both participants are symmetric in the frame representation as both occur as AGENTS in the CAUSE and as BEARERS in the RESULT-STATE. It is not possible to tell apart which participant an *-ee* form refers to because they behave identically in all sub-eventualities. Thus, two possible referents in their non-volitional reading in the sub-eventuality [4] are the expected result.

3.2 *-ee* nominalizations with *-er/-or* bases

The data on denominal *-ee* derivatives show an interesting subset with *-er/-or* forms as their bases. For example, the derivative *tutee* is most likely constructed on the noun *tutor*. According to Bauer et al. (2013: 524) these nouns are paradigmatically related to each other. This relation arises when the new word has the same base but a different suffix. This is especially interesting as the data show that many *-ee* derivatives come into being not by suffixation to a base (i.e., a syntagmatic process), but by a paradigmatic process (see also Bonami and Guzmán Naranjo 2023). The analysis proposed here will show that the process operates on the same eventualities. Hence, the paradigmatic process is shown by the switch of the reference from one participant to another in the same eventuality. Some of the bases in this subset appear to be derived but are non-derived. For example, according to the OED, the word *tutor* was loaned from French or Spanish as a complex word and not derived within the morphological system of English. Nonetheless, it is possible to form *tutee* parallel to *tutor* by changing the apparent suffix although the *-or* form is non-derived. The semantic representation of the *-er/-or* bases and the reference shifts to a different participant are more straightforward due to the fact that the eventuality is already given by the respective *-er/-or* forms and is therefore more readily available.

The example illustrated in detail in this paper is the *-ee* derivative *tutee* as in (9):

- (9) ‘I used to have a **tutee** who lived there.’ she told Guido. ‘A *tutee*.’ Guido laughed at that. ‘Little miss schoolmistress.’ (BNC, FIC, 1993)

The derivative is based on the noun *tutor*. The noun *tutor* is sufficiently more frequent than the verb to assume that the noun serves as the base. The word *tutor* occurs as a loan word around 1500⁷ and *tutee* in the 1920's (OED). The verb *tutor* occurred in 1590. However, the meaning of the verb is definitely based on the eventuality given by *tutor*_N. Due to the fact that the verb is built on the eventuality denoted by the loan word and the immensely higher frequency of the noun, the assumption of a paradigmatic relation between the two nouns, *tutor* and *tutee*, is straightforward. Additionally, this relation is visible due to the change of the alleged suffix. Figure 7 illustrates the frame for *tutee*.

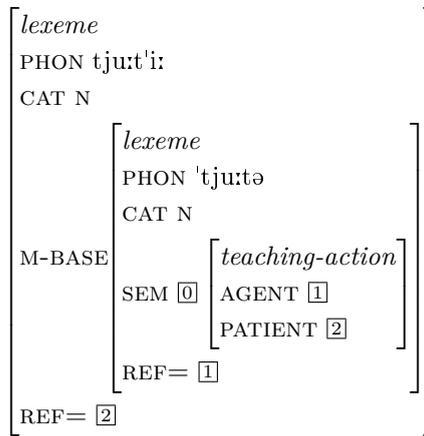


Fig. 7: Representation of the lexeme *tutee*.

The *teaching-action*⁸ is directly accessible from *tutor*. The reference of *tutor* is on the element indexed with $\boxed{1}$ as *tutor* denotes the AGENT of the *teaching-action*. The derivative *tutee*, on the other hand, has a different REFERENCE-attribute which points to a different entity, namely the PATIENT of the *teaching-action* indexed with $\boxed{2}$. The two lexemes refer to different participants in the same eventuality to create the meanings of *tutor* and *tutee*.

⁷ It occurred even earlier in nowadays obsolete contexts.

⁸ The special interaction of student and tutor is probably not entirely described with the label *teaching-action* as this relation may contain more than teaching. However, for the illustration of the derivational process, the label is sufficient.

A second example of an *-ee* derivative with a pseudo-derived base is the derivative *mentee* in (10):

- (10) One corporate lawyer scratched his tradition of grabbing Christmas drinks with a female **mentee**, and opted for the safer alternative of lunch. (COCA, NEWS, 2018)

The derivative *mentee* denotes the person who is supervised. The related word *mentor* is, as well as *tutor*, a loan word from French. The noun *mentor* is sufficiently more frequent than the verb which leads to the assumption that the noun serves as the base. The first attestation of *mentor*_N in the OED is from 1750 and *mentee* occurs in 1965. The verb *mentor* occurred in 1918 and is based on the eventuality given by *mentor*_N. The paradigmatic relation between the two nouns is straightforwardly visible due to the change of the alleged suffix and the operation on the same eventuality.

The semantic representation of *mentee*, then, looks similar to the one of *tutee*. The specification of the eventuality is changed into a *supervising-action*. *Mentor* denotes the AGENT and *mentee* the PATIENT. Both forms operate on the same eventuality but target a different participant of this eventuality (*supervising-action*). Thus, the word-formation process with the suffix *-ee* works similarly for the bases in section 3.1 and *-er/-or* bases as a non-volitional and sentient participant is referred to.

3.3 Formalization of the semantic restrictions on *-ee* formations

The restrictions for the suffix *-ee* described in section 2.3 are that the derivational process with the suffix *-ee* requires a participant which has to be sentient and non-volitional. These restrictions also underlie all of the examples formalized in sections 3.1 and 3.2 and can be regarded as the basis of the regular semantics of *-ee* nominalizations. However, exceptions to the non-volitionality constraint can be found in the literature on *-ee* for deverbal and denominal nominalizations. More precisely, Barker (1998) pointed out that some derivatives with *-ee* can also refer to volitional entities. One example is *escapee* which, just as the also existing derivative *escaper*, denotes the AGENT of the *escaping-action* from the verb *escape*. According to Barker (1998), this is possible for *-ee* derivatives with bases that are either intransitive verbs, or verbs that can be interpreted as having a non-volitional subject participant, like *stand*, for example. The data on

denominal derivatives (Barker 1998, Plag 2004, Mühleisen 2010) also shows *-ee* derivatives which denote AGENTS, for example, *bargee* in example (11).

- (11) ‘I’m a **bargee**, owner-operator, that’s my ship down there,’ she said, pointing down the side of the quay. (BNC, FIC, 1985-1994)

Divergent semantic classes of a word-formation process can be captured in inheritance hierarchies (Riehemann 1998, Koenig 1999, Booij 2010, Bonami and Crysman 2016, Plag et al. 2018). Figure 8 shows such an inheritance hierarchy for denominal nominalizations derived by the suffix *-ee*. The abbreviation *n-n-lfr* stands for noun-to-noun lexeme formation rule and indicates that the categories under this node describe denominal nominalizations. The hierarchy severs the phonological component (PHON) of the word-formation process from different semantic (SEM) categories.

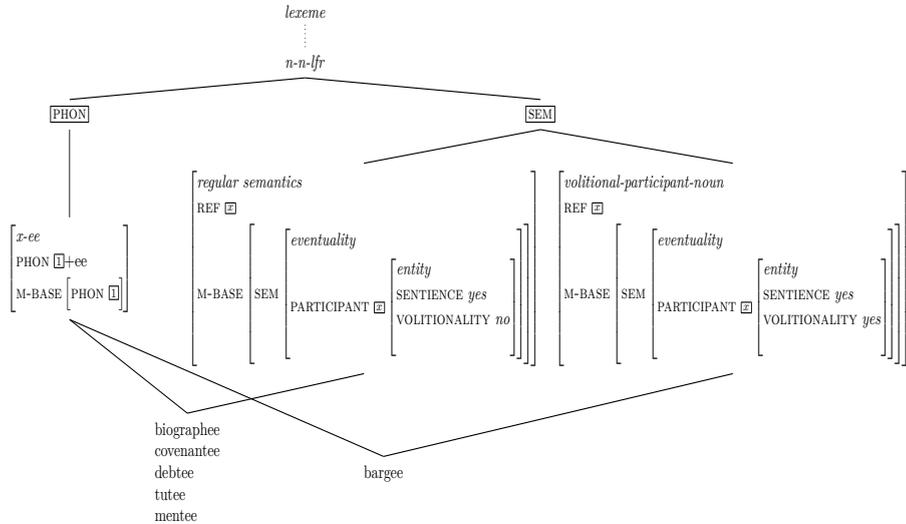


Fig. 8: Inheritance hierarchy of lexical rules for *-ee* including regular semantics and volitional exceptions.

On the left side of the inheritance hierarchy, the phonological realization (PHON) of the derivative is described. The phonology of the base is modified by adjusting the phonological form according to the information of the suffix, in this case the suffix *-ee*. On the right side, the semantic specification of a lexeme-formation rule is illustrated. The left node describes the *regular semantics*

investigated in this paper. In order to derive the *regular semantics*, a *non-volitional-participant-noun*, the base (M-BASE) must provide but not necessarily denote an eventuality with a participant which is non-volitional and sentient (PARTICIPANT). This constraint is described by the reference (REF) which is on the element indexed with \boxplus . The individual derivatives discussed in this paper have their reference on a participant which meets the constraints given in the *regular semantics* node in the inheritance hierarchy. The derivatives discussed in sections 3.1 and 3.2, e.g., *biographee* and *tutee*, connect the phonological component of the word-formation process with its regular semantics. These forms are listed below each other.

The right semantic node illustrates the semantic make-up of the exceptions. The participant which is referred to by the *-ee* derivative is sentient and volitional which leads to a *volitional-participant-reading* as in *bargee*.

4 Discussion and outlook

The aim of this study was to investigate denominal nominalizations with the suffix *-ee*. The research questions asked whether it is possible to find an eventuality in the nominal base and how the assumed referential shift induced by the word-formation process can be explained and modeled. A word-formation process can attach to several different word classes (e.g., Plag 2004). However, eventuality-related word-formation processes clearly prefer verbal bases. In turn, this preference is grounded in the fact that verbs denote eventualities themselves. Nouns, on the other hand, usually denote things or participants in eventualities (see, e.g., Haspelmath 2001, Van Valin and LaPolla 2002, Szabó 2015, Moltmann 2019). Moreover, conversion in English makes it in many cases impossible to decide unambiguously to which word class the base belongs. However, for the semantic approach in this paper, the word class of the base is not of paramount importance. The analysis of denominal derivatives with *-ee* demonstrates that nouns can, as well as verbs, provide the eventive elements that are required for the word-formation process. In contrast to verbs, deeper decomposition of the semantics of nouns might be necessary to reveal the required eventive elements. Consequently, the word class of a base does not have a central role for eventuality-related nominalizations. Rather, the semantics provided by the base word is crucial. Assuming that the semantics are central for word-formation processes in general, every word that has the eventive elements for the process in its semantic representation can serve as potential base, regardless of its word class. The word-formation process can

then shift reference to an eventive element in the eventuality in the semantic representation of such a base.

The approach applied in this paper is one of semantic decomposition and reference shifting and thus similar to the approach by Plag et al. (2018) and Kawaletz (2021) for deverbal nominalizations with the suffix *-ment*. This approach allows us to decompose the base into its semantics which consists of eventive elements like (sub-)eventualities and participants. In some cases, the eventive elements that are used for the nominalization process are deeply embedded in the semantic structure. Applying the analysis to denominal derivatives and their base words in this paper demonstrates that seemingly non-eventive nouns like *biography* have eventualities embedded in their semantic representation. The REFERENCE attribute allows for the inclusion of the reference of base and derivative in one frame. The approach used in this paper is a non-coercive approach. Coercion of eventive elements is not needed, as such elements have been shown to already be provided by the respective bases. Thus, the analyses presented in this paper are in line with frameworks that assume embedded eventualities in the semantics of non-eventive nouns (see, e.g., Pustejovsky 1996: ch. 6).

As a consequence of the exceptions to the volitionality constraint for suffixation with *-ee*, the inheritance hierarchy in section 3.3 does not only depict the *regular semantics* for derivatives with the suffix *-ee* but also the possibility of such derivatives to refer to volitional participants. The restrictions that a volitional participant can only be the target for a nominalization with the suffix *-ee* if no non-volitional participant is present in the semantic representation of the base word needs systematic testing. For bases lacking a non-volitional participant in their semantic representation, affix competition between *-ee* and *-er* might be involved in the process of *-ee* referring to a volitional participant as well. Similar problems of mismatches between eventuality-denoting derivatives and their nominal bases arise with other suffixes like *-age*, *-ance*, *-ation*, *-er*, *-ment*, *-ure* (Plag 2004, 2018: ch. 4). The approach proposed in this paper can potentially be used for the analysis of other nominalizations as well.

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Bibliography

- Alexiadou, A. (2001). *Functional structure in nominals: Nominalization and ergativity*, volume 42 of *Linguistik aktuell*. John Benjamins Publishing Company, Philadelphia.
- Alexiadou, A. (2010). Nominalizations: A probe into the architecture of grammar part I: The nominalization puzzle. *Language and Linguistics Compass*, 4(7):496–511.
- Bach, E. (1986). The algebra of events. *Linguistics and Philosophy*, 9(1):5–16.
- Balteiro, I. (2007). *The directionality of conversion in English: A dia-synchronic study*, volume 59 of *Linguistic insights*. Lang, Bern and New York.
- Barbu Mititelu, V., Iordăchioaia, G., Leseva, S., and Stoyanova, I. (2023). The meaning of zero nouns and zero verbs. In Kotowski, S. and Plag, I., editors, *The semantics of derivational morphology: Theory, methods, evidence*. de Gruyter.
- Barker, C. (1998). Episodic -ee in English: A thematic role constraint on new word formation. *Language*, 74(4):695.
- Barsalou, L. W. (1992a). *Cognitive psychology. An overview for cognitive sciences*. NJ: Erlbaum, Hillsdale.
- Barsalou, L. W. (1992b). *Frames, concepts, and conceptual fields*. *Frames, Fields, and Contrasts: New Essays in Semantic and Lexical Organization*. Lawrence Erlbaum Associates, Hillsdale, N.J.
- Bauer, L., Lieber, R., and Plag, I. (2013). *Oxford reference guide to English morphology*. Oxford Univ. Press, Oxford.
- Bonami, O. and Crysmann, B. (2016). The role of morphology in constraint-based lexicalist grammars. In Hippisley, Andrew, Stump, and Gregory T, editors, *Cambridge Handbook of Morphology*, pages 609–656. Cambridge Univ. Press.
- Bonami, O. and Guzmán Naranjo, M. (2023). Distributional evidence for derivational paradigms. In Kotowski, S. and Plag, I., editors, *The semantics of derivational morphology: Theory, methods, evidence*. de Gruyter.
- Booij, G. E. (2010). *Construction morphology*. Oxford linguistics. Oxford Univ. Press, Oxford.
- Borer, H. (2013). *Taking form*, volume 3 of *Structuring sense*. Oxford Univ. Press, Oxford, first edition.
- Bram, B. (2011). *Major total conversion in English*. PhD dissertation, Victoria Univ., Wellington.
- Davies, M. (2004). British National Corpus (from Oxford Univ. Press).
- Davies, M. (2008-). The Corpus of Contemporary American English (COCA): One billion words, 1990-2019.
- Gamerschlag, T., Gerland, D., Osswald, R., and Petersen, W. (2014). General introduction. In Gamerschlag, T., editor, *Frames and concept types*, *Studies in Linguistics and Philosophy*, pages 3–21. Springer, Cham.
- Grimshaw, J. B. (1990). *Argument structure*, volume 18 of *Linguistic inquiry monographs*. MIT Press, Cambridge, Mass.

- Haspelmath, M. (2001). Word classes and parts of speech. In Smelser, N. J. and Baltes, P. B., editors, *International encyclopedia of the social & behavioral sciences*, pages 16538–16545. Elsevier, Amsterdam.
- Kawaletz, L. (2021). *The semantics of English -ment nominalizations*. PhD Dissertation, Heinrich-Heine-Universität Düsseldorf.
- Kawaletz, L. and Plag, I. (2015). Predicting the semantics of English nominalizations: A frame-based analysis of –ment suffixation. In Bauer, L., Körtvélyessy, L., and Štekauer, P., editors, *Semantics of complex words*, pages 289–319. Springer, Dordrecht.
- Koenig, J.-P. (1999). *Lexical relations*. Stanford monographs in linguistics. CSLI Publ. Center for the Study of Language and Information, Stanford, Calif.
- Larson, R. K. (1998). Events and modification in nominals. *Semantics and Linguistic Theory*, 8:145.
- Lieber, R. (2004). *Morphology and lexical semantics*. Cambridge Univ. Press, Cambridge.
- Lieber, R. (2016). *English nouns: The ecology of nominalization*, volume 150 of *Cambridge studies in linguistics*. Cambridge Univ. Press, Cambridge.
- Lieber, R. (2017). Nominalization: General overview and theoretical issues. In Aronoff, M., editor, *Oxford research encyclopedias*. Oxford Univ. Press, Oxford.
- Löbner, S. (2013). *Understanding semantics*. Understanding language series. Routledge, London, second edition.
- Löbner, S. (2014). Evidence for frames from human language. In Gamerschlag, T., editor, *Frames and concept types*, volume 94 of *Studies in Linguistics and Philosophy*, pages 23–67. Springer, Cham.
- Moltmann, F. (2019). Natural language and its ontology. In Goldman, A. I. and McLaughlin, B. P., editors, *Metaphysics and cognitive science*, pages 206–232. Oxford Univ. Press, New York, NY, USA.
- Mühleisen, S. (2010). *Heterogeneity in word-formation patterns: A corpus-based analysis of suffixation with -ee and its productivity in English*, volume 118 of *Studies in Language Companion Series*. John Benjamins, Amsterdam and Philadelphia.
- OED (2021). *Oxford English Dictionary online*. Oxford Univ. Press.
- Petersen, W. (2007). Representation of concepts as frames. In Skilters, J., Toccafondi, F., and Stemberger, G., editors, *Complex Cognition and Qualitative Science: A legacy of Oswald Kulpe (The Baltic international yearbook of cognition, logic and communication 2)*, volume 2, pages 151–170. Univ. of Latvia, Riga.
- Plag, I. (1999). *Morphological productivity: structural constraints in English derivation*, volume 28 of *Topics in English Linguistics [TiEL]*. de Gruyter, Berlin.
- Plag, I. (2004). Syntactic category information and the semantics of derivational morphological rules. *Folia Linguistica*, 38(3-4):193–225.
- Plag, I. (2018). *Word-formation in English*. Cambridge textbooks in linguistics. Cambridge Univ. Press, Cambridge, United Kingdom and New York, NY, second edition.
- Plag, I., Andreou, M., and Kawaletz, L. (2018). A frame-semantic approach to polysemy in affixation. In Bonami, O., Boyé, G., Dal, G., Giraud, H., and Namer, F., editors, *The lexeme in descriptive and theoretical morphology*, pages 467–486. Language Science Press, Berlin.
- Pollard, C. and Sag, I. A. (1994). *Head-Driven Phrase Structure Grammar*. The University of Chicago Press, Chicago, IL.
- Pustejovsky, J. (1996). *The generative lexicon*. A Bradford book. MIT Press, Cambridge, Mass., second edition.

- Riehemann, S. Z. (1998). Type-based derivational morphology. *Journal of Comparative Germanic Linguistics*, 2(1):49–77.
- Szabó, Z. G. (2015). Major parts of speech. *Erkenntnis*, 80(S1):3–29.
- Van Valin, R. D. and LaPolla, R. J. (2002). *Syntax: Structure, meaning and function*. Cambridge textbooks in linguistics. Cambridge Univ. Press, Cambridge, reprinted edition.
- Winter, Y. and Zwarts, J. (2012). On the event semantics of nominals and adjectives - the one-argument hypothesis. *Proceedings of Sinn und Bedeutung*, 16(2):639–647.