The English gerund revisited: Exploring semantic differences through collocational analysis

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Abstract

This paper re-examines the semantics of Present-day English gerunds by analyzing their collocational preferences. While traditional approaches suggest that a semantic opposition between ‘actions’ and ‘facts’ determines the meaning of nominal (the signing of the contract) and verbal (signing the contract) gerunds as well as their distributional preferences, these claims have not been supported by quantitative evidence. At the same time, recent studies which analyze the semantics of gerunds from a referential perspective lack a distributional dimension. By means of a distinctive collexeme analysis which has been applied to contextual collexemes rather than construction-internal ones, this study presents a semantic typology of the nouns and verbs that are attracted to nominal and verbal gerunds in noun and verb complementation structures. The analysis shows that, while nominal and verbal gerunds occur in clearly distinctive contexts, this distinction does not appear to be based on an action-fact dichotomy, but is rather determined by the more abstract features of conceptual (in)dependence and temporal flexibility. Finally, it is shown how these abstract semantic profiles can be filled in more concretely by specific contextual slots, thus arriving at a more fine-grained and dynamic perspective on the semantics of English gerunds.

1. Introduction

Recent years have witnessed a renewed interest in the semantics of the English gerund. Once considered only secondary to form (Chomsky 1970, Fraser 1970, Comrie 1976), research into the meaning of nominal gerunds, as in (1), and verbal gerunds, as in (2a–b), has long centered on a binary opposition between ‘action’ vs. ‘fact’ semantics, ‘second-order’ vs. ‘third-order’ entities and ‘State-of-Affairs’ vs. ‘propositions’ (Lees 1966, Vendler 1968, Langacker 1991, Dik & Hengeveld 1991, Mackenzie 1996, 2004, Cristofaro 2003, Dixon 2006, Boye 2012).

- (1) The third objective would be to aid in *the recruiting of new employees*. (COCA)
- (2) a. Designers should check locally to determine whether the Local Act is still operative in the area proposed for *building a high-bay warehouse*. (BNC)
b. Conservatives have never forgiven the President for *breaking his “no new taxes” pledge to get his last economic package*. (COCA)

Nominal gerunds, which have both the external distribution as well as the internal syntax of noun phrases, were thereby considered to be typically action-referring, while the more clausal verbal gerunds were argued to invite both action-referring (2a) and propositional readings (2b). Accordingly, nominal

gerunds have often been associated with contexts that highlight their action semantics, while verbal gerunds tend to be linked to epistemic contexts (Vendler 1968, Kiparsky & Kiparsky 1970, Mackenzie 2004, Dixon 2006).

Inspired by more functionally-oriented studies, both synchronic and diachronic (Fanego 2004, De Smet 2007, 2008, Heyvaert 2003, 2008, Fonteyn 2016, Maekelberghe subm.), current research appears to have dispensed with the dichotomous approach and has instead taken a more discourse-functional stance towards semantics, which is centered on the notion of reference (Fonteyn, Heyvaert & Maekelberghe 2015: 585, Fanego 2004, De Smet 2007, 2008, Heyvaert 2003, 2008, Fonteyn 2016b, Maekelberghe forthc.). Rather than focusing on particular semantic labels, these studies zoom in on the status of nominal and verbal gerunds as discourse referents and are especially interested in the different ways in which both constructions *conceptualize* events. As such, nominal gerunds are argued to show a preference for existentially presupposed and conceptually independent entities, while verbal gerunds are said to more often conceptualize conceptually dependent entities with existential flexibility (Fonteyn, Heyvaert & Maekelberghe 2015, Maekelberghe forthc.). This is illustrated in the examples below: While the nominal gerund in example (3) conceptualizes a specific and existentially presupposed entity that is marked as identifiable by the definite article, the verbal gerund in (4) refers to an existentially virtual situation that is conceptually dependent on the temporal orientation of the matrix verb and the control relation with the matrix clause subject *you* to receive specific reference. Thus, nominal and verbal gerunds are shown to especially differ with regard to the types of referential strategies they employ, viz. (definite) determination with nominal gerunds and the more clausal mechanism of ‘control’ with verbal gerunds.

- (3) When the President reacted to *the sinking of the Lusitania in 1915* by declaring that Americans were “too proud to fight,” Roosevelt called the sinking “piracy pure and simple” and warned that America would earn “scorn and contempt if we follow the lead of those who exalt peace above righteousness.” (COCA)
- (4) Have you ever thought of *giving this baby up*? (COCA)

While the dichotomous approach makes claims about distributional patterns without providing quantitative evidence, the referential analyses discussed above are quantitatively-oriented and corpus-based but do not touch on the topic of distribution. The present paper envisions to bridge the gap between these two approaches by drawing on more collocationally-driven methods: building on Heyvaert’s (2008) claim that a gerund’s meaning – such as its action or fact semantics – largely depends on the context it is embedded in, this paper wishes to explore how semantic description can also benefit from a distributional and collocational perspective. In order to do so, I will apply a distinctive collexeme analysis (Gries & Stefanowitsch 2004) to a set of nominal and verbal gerunds extracted from the COCA corpus. Rather than exploring which lexemes are attracted to the gerund constructions themselves, I will

use this analysis to trace the lexemes that distinctively co-occur with nominal and verbal gerunds in specific contextual slots. More specifically, I will zoom in on gerunds that function as direct objects or complements to verbs, as in (5), and complements to nouns, as in (6). By means of the distinctive collexeme analysis, then, I will assess which predicates and head nouns are attracted to either the nominal or verbal gerund construction.

- (5) a. There is nothing that **justifies**, let alone compels, *the taking of such a great risk*. (COCA)
- b. Mayor Jackson imposed the curfew for Thursday night only but said he would **consider** *extending the curfew day by day*. (COCA)
- (6) a. The **story** of *the forging of the British government's response to AIDS* remains to be written. (COCA)
- b. So what can you do to better your **chances** of *getting the truth*? (COCA)

A semantic analysis of these lexemes will allow us to reassess the traditional labels that have figured in the literature on gerunds for a long time and reconsider current referential approaches from a distributional perspective, by checking whether we find concrete evidence for the gerund's abstract referential profile in the types of contexts it selects. It is moreover argued that taking into account the distributional potential of nominal and verbal gerunds can provide a more dynamic picture of their semantics, as it not only encompasses the meaning of the gerund construction itself, but also the interaction with its immediate surroundings.

This paper is structured as follows: An overview of previous studies on the semantics of gerunds is provided in Section 2. Section 3 will discuss the collocational methodology used in this paper. Sections 4 and 5 will zoom in on the two contextual slots under investigation, viz. the direct object and noun complement function. Each section will first provide a short summary of current research on these two particular slots, after which I will present the results of the collocational analysis. Section 6 will discuss how these collocational analyses can lead to a more fine-grained and nuanced view on the semantics of gerunds. Finally, all observations will be synthesized in Section 7.

2. The semantics of gerunds: state of the art

In his transformational account of English nominalizations, Lees (1966) offers a first semantic classification of Present-day English gerunds. Nominal gerunds, as in (7), which he labels “action nominalizations”, are argued to be solely action-referring. Verbal gerunds or “gerundive nominals”, on the other hand, can either be action-referring, in which case they are necessarily subjectless, as in (8), or they can refer to facts, as in (9).

- (7) *The closing of the gate* takes five minutes.

- (8) *Eating vegetables* is healthful. (Lees 1966: 58)
 (9) *His having eaten vegetables* was a great surprise. (ibid.)

While no thorough motivation is given as to why precisely nominal gerunds are action-referring and verbal gerunds can also have propositional value, this privative opposition between both gerund types has found its way into most synchronic accounts of the English gerund. As such, nominal gerunds are typically referred to as “action nominalizations” (see, amongst others, Chomsky 1970, Fraser 1970, Newmeyer 1970, Comrie 1976, Schachter 1976), while verbal gerunds tend to be associated with factive verbs in the context of complementation (e.g., Kiparsky & Kiparsky 1970, Thompson 1973, Noonan 1985, Dixon 2005: 323). A similar contrast can be found within more functional frameworks, albeit under a different terminology. Based on Lyons’ (1977) typology of entities, Mackenzie (1996, 2004: 974) considers nominal gerunds to represent so-called “second-order entities”, viz. entities which typically refer to events, processes and state-of-affairs and which are evaluated in terms of their reality status (Lyons 1977: 443). Verbal gerunds, on the other hand, are argued to conceptualize “third-order entities”, abstract entities referring to propositions which are “located outside time and space” (Lyons 1977: 443). A similar contrast is found in Dik & Hengeveld (1991), Cristofaro (2003) and Boye (2012), who use the terms ‘state-of-affairs’ and ‘propositions’. Whereas the notion of ‘fact’ as it is used in Vendler (1968) and Lees (1966) might misleadingly suggest that verbal gerunds with a fact semantics are necessarily “presupposed true”, the terms ‘proposition’ and ‘third-order’ entity can be considered more accurate, as they only entail that the situation described by the verbal gerund should have truth value (Boye 2012: 192) without necessarily being presupposed, as in example (10b). In line with this description, verbal gerunds are argued to allow for epistemic modification, as can be witnessed in example (10b), where the adverb *unlikely* “represents the degree of epistemic support for some piece of information about the world” (Boye 2012: 197). The state-of-affairs referred to by the nominal gerund in (10a), on the other hand, is considered to be a mere representation of “something which is in the external world”, and, therefore, “not something for which we can have epistemic justification” (Boye 2012: 196). In the remainder of this paper, I will use the term ‘fact’ in the sense of third-order entity and proposition.¹

- (10) a. ?Her singing of the aria next week is unlikely.
 b. Her singing the aria next week is unlikely. (Boye 2012: 208)

The contrast between the second-order (state-of-affairs) and third-order (propositional) nature of nominal and verbal gerunds respectively is often illustrated in comparative contexts such as the ones in

¹ The fact that Vendler mentions a non-factive predicate like *anticipate* as a typical container for verbal gerunds indicates that he too interprets the notion of ‘fact’ in this broader sense.

(11). While the nominal gerund in (11a) evokes a manner-reading of the situation referred to in the direct object slot (“He criticized *the way in which* John threw the dice”), the verbal gerund in (11b) is said to simply refer to the fact that the situation occurred (“He criticized *the fact that* John threw the dice”) (see also Lees 1966: 65, Mackenzie 1996, 2004, Vendler 1968, Langacker 1991, Kiparsky & Kiparsky 1970, Dixon 2005: 324, Dixon 2006: 16).

- (11) a. He criticized *John’s throwing of the dice*.
- b. He criticized *John’s throwing the dice*. (Dixon 2005: 323)
- (12) What did you think of *his driving*? (Mackenzie 2004: 981)

The sentence in example (12), then, is argued to be not only semantically ambiguous between a state-of-affairs-reading (“what did you think of the way in which he was driving?”) and a propositional reading (“what did you think of the fact that he was driving?”), but also ambiguous between two syntactic structures: a nominal gerund and a verbal gerund (Mackenzie 2004: 981, Vendler 1968: 50–51, Dixon 2006: 16).

Interestingly, the different interpretations attributed to nominal and verbal gerunds are also claimed to be manifested in their distributional preferences. Mackenzie (2004: 981), for instance, notes that nominal gerunds “are appropriate in contexts where a sequence of events is being described”, while verbal gerunds “prefer epistemic contexts”. Likewise, Vendler (1968: 78) mentions that typical “containers” for nominal gerunds (or “e-forms” in his terms) include action-referring lexemes such as *take place, follow, observe*, in contrast to the more factive or epistemic lexemes associated with verbal gerunds (or “d-forms”), such as *mention, deny* and *anticipate*.

Already early on, however, the semantic labels of action and fact have been challenged. It has been noted, for instance, that nominal gerunds can also combine with factive verbs, as in (13), and that verbal gerunds with expressed subject can also be action-referring, as in (14) (Langacker 1991, Declerck 1991, Heyvaert 2008). Moreover, as pointed out in Heyvaert (2008: 43), the labels of action and fact should not be considered “of equal value”, since “nominals can designate or encode actions (...) [but] cannot be said to encode facts”. Instead, she argues, it is the context that determines whether or not a nominal or clause receives a factive meaning.

- (13) The genre Harper enjoys most is espionage thrillers, so he bemoans *the lifting of the Iron Curtain*. (COCA)
- (14) My husband speaks very well, but his job involves *my answering the phone on his behalf quite a bit of the time*. (Heyvaert 2008: 43)

Recent studies have therefore taken a more discourse-functional approach to the semantics of gerunds (Schachter 1976, Heyvaert 2008, De Smet 2007, 2008, Fonteyn, De Smet & Heyvaert 2015, Fonteyn,

Heyvaert & Maekelberghe 2015, Fonteyn 2016a, Fonteyn & Heyvaert 2016, Maekelberghe forthc.). Early synchronic approaches (Schachter 1976, Heyvaert 2008) were mainly aimed at reconciling the more clausal make-up of verbal gerunds with the nominal system of referentiality, drawing parallels between various types of verbal gerunds and ordinary NPs. Determinerless generic verbal gerunds, as in (15), for instance, are compared to generic uncount NPs (see example (16)), while specific verbal gerunds, depending on whether or not they occur with an explicit subject, are likened to either definite common nouns (17) or proper names (18) (Heyvaert 2008: 68–69).

- (15) *Going to the beach* is enjoyable. (Schachter 1976, as cited in Heyvaert 2008: 55)
- (16) *Milk* does something for every body. (ibid.)
- (17) *Magic Johnson's having the AIDS virus* is just as great a national catastrophe as the assassination of President Kennedy and the Challenger disaster. (CB, Heyvaert 2008: 65) [definite noun strategy]
- (18) Presidents Bush and Yeltsin wrapped up their Washington summit today by *signing a series of agreements on arms control and trade*. (CB, Heyvaert 2008: 69) [proper name strategy]

More recently, diachronic studies have explored the changing discourse-functional and referential status of both the nominal and the verbal gerund (De Smet 2007, De Smet 2008, Fonteyn 2016a, Fonteyn & Heyvaert 2016, Fonteyn, Heyvaert & Maekelberghe 2015). Historically, the verbal gerund developed out of the nominal gerund around the Middle English period (Tajima 1985, Donner 1986, Jack 1988, van der Wurff 1993, 1997, Fanego 1996, 2004, De Smet 2007). Along with the formal hybridity that resulted from the rise of a more verbal gerund type, the gerundive system increasingly manifested functional hybridity, as well. One of the clearest indicators of this functional hybridity are the different strategies of reference or “grounding” that are adopted by nominal and verbal gerunds (De Smet 2008, Fonteyn 2016b, Fonteyn, Heyvaert & Maekelberghe 2015). Nominal gerunds, it is shown, rely on nominal grounding strategies, specializing over time in a number of uses that are functionally motivated by the presence of the definite article, which indicates that a referent is specific, identifiable and susceptible to anaphoric tracking. In example (19), the nominal gerund refers to an instance that is identifiable on the basis of the preceding discourse and is marked accordingly by the definite article (De Smet 2007, 2008, Fonteyn, De Smet & Heyvaert 2015, Fonteyn 2016b). A large group of verbal gerunds, on the other hand, appear to form a deviation from the nominal system of referentiality (Fonteyn 2016a, Fonteyn & Heyvaert 2016) as they make use of more clausal referential strategies. The verbal gerund in (20), for instance, singles out a specific and familiar referent without employing nominal strategies of determination. Instead, the functional import of the definite article is replaced by the verbal gerund's interaction with the matrix clause, which provides a specified subject (*Plumton*) and a temporal location and thus serves to indirectly “ground” the verbal gerund's referent.

- (19) And at the same time welle were the same susteres that *seyden these orisouns*. And summe of hem wesch with grete vertu, and summe lesse, an summe vnnethes touched a lytell drope, or they wesch after þe deuocion that they hadde in *the seying of þe orisones*. (1470–1500, PPCME2, Fonteyn 2016a: 131)
- (20) Plumton is now owner of it, aman of fair land: and lately augmentid by *wedding the doughter and heir generale of the Babthorpes*. (1535–1543, PPCME, De Smet 2008: 72)

This functional differentiation between nominal and verbal gerunds is examined more systematically for Present-day English in Maekelberghe (subm.). In order to fully grasp the functional hybridity of gerunds, this paper presents a multilayered model of referentiality which teases apart three basic referential features: (in)definiteness, (non-)specificity and existential status (actual/virtual). Especially the latter feature constitutes an innovation to previous referential studies, as it accommodates the fact that nominal and verbal gerunds are essentially eventive nouns, which refer to entities that can also be described along a temporal axis. It is shown that nominal gerunds, similar to ordinary NPs, tend to merge definiteness, specificity and an actualized existential status, as in example (21), where *the unveiling* refers to a situation which has already taken place and which is marked as specific and identifiable. Verbal gerunds, on the other hand, typically lack this functional overlap. They illustrate how specificity can be realized independently of (in)definiteness markers by making use of more clausal referential strategies, replacing determiners with control relations. On a temporal and existential level, a similar kind of detachment is found: while nominal gerunds with specific reference are typically existentially presupposed, specific verbal gerunds are not significantly associated with either an actual or a virtual existential status. In (22), for instance, the situation described by the verbal gerund receives specific reference through the control relation with the matrix clause participant *Mr Surkov*, but it does not refer to a definite, identifiable situation nor to an existentially presupposed one.

- (21) For instance, *the unveiling of the 500-pound bronze statue in the Petty Garden* occurred only 45 minutes before he was to qualify his Pontiac for the last time. (COCA)
- (22) Mr Surkov would get the chance of *seeing the duty solicitor*. (BNC)

The referential profiles which emerge from these studies can be associated with the position of nominal and verbal gerunds on the so-called “nouniness squish” (Ross 1973; see Fonteyn, Heyvaert & Maekelberghe 2015, Fonteyn 2016a, Maekelberghe forthc.). Nominal gerunds, as the formally more “nouny” constructions, are expected to exhibit more nominal traits on a functional level as well. Verbal gerunds, on the other hand, should then display more clausal functional behavior. As shown in Fonteyn, Heyvaert & Maekelberghe (2015) and Maekelberghe (forthc.), the nominal gerund’s preference to

conceptualize definite, specific and actualized entities can be related to the conceptual profile of prototypical nouns, which typically denote existentially presupposed and temporally enduring entities. Verbal gerunds, in contrast, reflect the existential flexibility and transient nature that is typical of clauses. Likewise, the observation that verbal gerunds tend to depend on control relations to receive specific reference is in line with Langacker's description of verbs as being conceptually dependent on their participants to be meaningful, while nominal gerunds, similar to prototypical NPs, typically denote conceptually autonomous entities (cf. the billiard-ball model of objects and interactions; Langacker 1991, 2002, 2009).

Studies into the semantics of nominal and verbal gerunds have thus moved from a binary semantic opposition between 'action'/'state-of-affairs' and 'fact'/'proposition' to a more conceptual approach, which focuses on the representation of gerunds as nominal or clausal discourse referents. While earlier studies examined the different meanings of nominal and verbal gerunds in comparative, but "made-up" contexts, such as the ones in examples (10)–(11), current referential approaches have taken on corpus-based methods, exploring general tendencies in the actual usage of gerunds. In doing so, the conceptualist approaches have allowed us to discern more subtle functional differences between nominal and verbal gerunds, showing how their formal hybridity is also manifested in their functional behavior. Moreover, unlike early semantic approaches, which neglected to provide a sound motivation for their claims, referential analyses have explicitly linked the diverging referential profiles of nominal and verbal gerunds to their formally more noun-like or verb-like profiles.

As of yet, however, the distributional preferences of nominal and verbal gerunds still remain largely unexplored. I therefore aim to reconcile some of the merits of early semantic approaches, especially their attention to contextual features, with the current referential analyses. This paper has three specific aims:

- (i) reassess the traditional semantic labels of 'action' and 'fact' by taking on a quantitative and collocational perspective;
- (ii) link the collocational ties of nominal and verbal gerunds to their respective referential profiles, and specifically their grounding mechanisms and existential status;
- (iii) finally, arrive at a more fine-grained and dynamic picture of the semantics of gerunds, which accounts for the fact that various features of its semantic profile can be highlighted or downplayed by contextual slots and collocates.

First, however, Section 3 reports on the datasets that were used for this paper and the collocational analysis that was applied to them.

3. Methodology

To arrive at a better understanding of how specific contextual slots can interact with a construction's meaning, this paper will focus on two functional slots: gerunds functioning as direct objects and as complements to nouns, as illustrated in examples (23)–(24).

- (23) a. The Marines have organized this ceremony to **celebrate** *the signing of a contract for the rebuilding of this school*. (COCA)
- b. The snow is now from 4 to 6 feet deep, which so obstructs the roads as to **prevent** *our receiving a supply of provisions*. (COCA)
- (24) a. This, in effect, models a **method** of *reframing of stress reactions* and offers hope for an alternative and more adaptive response. (COCA)
- b. Moore managed the tricky balancing **act** of *creating works that were conceptually daring and progressive yet still understandable and accessible to viewers who know little about art history and are often put off by abstraction*. (COCA)

For the collocational analysis, a distinctive collexeme analysis was carried out (see Gries & Stefanowitsch 2004 for a detailed account). The distinctive collexeme analysis belongs to the family of collostructional analyses, and is mainly used to assess the attraction of lexemes to members of an alternating pair, in this case the nominal and verbal gerund. While collostructional analyses mostly focus on which lexemes are attracted to the constructions *themselves* (by analyzing, for instance, which verbs are attracted to the ditransitive vs. the prepositional dative), I will use the distinctive collexeme analysis to assess which **matrix clause predicates** and **head nouns** are most strongly attracted to one member of the alternating pair (the nominal gerund) as opposed to the other (the verbal gerund). Several motivations lie behind the choice for these two particular slots. The first one is a practical one, as predicates and nouns typically provide content-rich information. Direct objects were chosen over subjects for two reasons. Firstly, verbal gerunds functioning as subjects are rather infrequent; moreover, as evidenced by a pilot study, gerunds in subject position frequently have the semantically empty copular verb *be* as their main predicate, which does not provide us with enough semantic clues that are needed for this particular study. Secondly, focusing on direct objects allows us to reassess earlier studies in a more direct fashion, as these often illustrated their claims by means of gerunds functioning as direct objects (e.g. *he criticized John's throwing [of] the dice*, cf. *supra*). Head nouns and their complements, on the other hand, have received little attention so far. Nonetheless, it will be argued in Section 5 that they can provide additional information about the gerund's semantic profile.

The distinctive collexeme analysis was carried out on data extracted from the 2010–2012 subperiod of the COCA corpus, which roughly comprises 50 million words. Since the analysis does not allow for the taking of samples, all nominal and verbal gerunds were extracted from this subsection. To collect the nominal gerunds, the corpus was searched for all nouns ending in *-ing* which were followed

by an *of*-phrase. Afterwards, all direct objects and postmodifiers were manually selected. Importantly, the distinctive collexeme analysis requires both constructions under investigation to alternate, e.g. the clause *break the rules* allows for both a nominal and verbal gerund construction ([*the*] *breaking* [*of*] *the rules*), while a clause like *ask if it is true* can be turned into a verbal gerund (*asking if it is true*), but not into a nominal gerund (**the asking of if it is true*). While most instances of nominal gerunds have verbal gerund alternatives, the opposite is not always the case. To restrict the dataset to alternating gerund constructions, some verbal gerunds thus had to be excluded from the collexeme analysis. More specifically, the search query for verbal gerunds was limited to verbal *-ing* forms – tagged as *vvg in the corpus – followed by articles, determiners, pronouns, possessives and adjectives. I thereby excluded those verbal gerunds which do not typically have a nominal gerund alternative, such as verbal gerunds followed by complementizers (*saying that is true*), prepositions (*swimming in the lake*) and nouns (*taking care of something*; or participial forms as *printing devices*). Even though this restricted query also excluded some alternating instances and thus partly overgeneralized, it is argued that the effect on the resulting dataset is only minor and does not influence the collocational analysis. In the case of verbal gerunds, direct objects and postmodifiers were pre-selected through the search query. Concretely, I looked for sequences of (i) lexical verbs followed by verbal *-ing* forms and (ii) nouns followed by prepositions and verbal *-ing* forms, both with an optional intervening proper name, pronoun or possessive to pick up on verbal gerunds with a genitive or oblique subject (e.g. *the idea of me doing the laundry*). Verbal gerunds not functioning as direct objects or postmodifiers, as in (25), were manually excluded from the results.

- (25) Sarah indicated that teachers could help **students by remembering the role**.
 [noun + preposition + verbal *-ing* form, but not a nominal complement]

Finally, some matrix predicates were excluded from the analysis. A first group consists of aspectual verbs (e.g. *he began receiving information*), the complements of which are often ambiguous between a gerundive and a participial reading (De Smet 2010). A second group includes combinations with sensory verbs such as *hear*, *feel* and *see*. While frequent with nominal gerunds, their verbal gerund alternatives involve structures like *he saw the boat sinking*, which are ambiguous with nouns followed by a reduced participial relative clause.

The number of instances yielded from the search queries discussed above are summarized in Table 1. These datasets were then used as input for the distinctive collexeme analysis.

	Nominal gerund	Verbal gerund	Total
Direct object	844	3253	4097
Postmodifier	360	8415	8775
Total	1204	11668	

Table 1: Overview of datasets distinctive collexeme analysis.

4. Direct objects

4.1. Background

This section is concerned with gerund constructions occurring in functional slots such as the following:

- (26) You may recall *the firing of Shirley Sherrod*. (COCA)
 (27) You might just recall *dumping a boxcar back in Amarillo*. (COCA)

Nominal gerunds occurring in these slots are analyzed as direct objects, whereas verbal gerunds like (27) are more commonly referred to as complement clauses. One could question, then, if constructions as in (26) and (27) lend themselves to a comparison. Dixon (2005, 2006), for instance, underscores that, although both constructions are superficially similar, they posit a “considerable grammatical difference”, examples like (26) representing a noun phrase with the *-ing* form as its head, while verbal gerund forms are essentially clauses (2006: 16). Looking at both constructions from a diachronic perspective, however, reveals that a comparison between them is not completely unfounded. As argued in De Smet (2013), the fact that verbal gerunds historically derive from abstract noun phrases – more specifically, bare nominal gerunds – motivates a “distributional association” between present-day gerund complements and noun phrases, especially mass or bare plural nouns which refer to events, actions or situations (De Smet 2013: 144).

Interestingly, the semantic labels of activity and factivity discussed above often figure in broader studies on complementation patterns (cf. Dixon 2006, Cristofaro 2003). Turning again to Dixon (2006), for instance, we find a classification of complement clauses into three recurrent (semantic) types, viz. fact, potentiality and activity complements. Based on typological evidence, factive complements are argued to have “similar structure to a main clause” (Dixon 2006: 23), while activity complements display more similarities to regular NPs, as they often lack tense and modality markers. In line with their lack of tense and modality markers, activity complements tend to exhibit a higher degree of temporal overlap with the main verb, whereas factive complements, being the more finite forms, are characterized by temporal independence from the matrix clause (Dixon 2006: 23). The relation between (non-)finiteness and temporal integration is well-documented, and is often linked to principles of iconicity and subsumed under the so-called “binding hierarchy” (Givón 1980, 1990, Haiman 1983, Rohdenburg 1995, Verspoor 2000). Figure 1 provides a schematic representation of the most prominent claims that are made with regard to the binding hierarchy. It is argued that there is an inverse correlation between the syntactic

integration of the complement clause into the main clause and its semantic independence from that main clause (cf. Givón 1990: 515–561, 973–975, Haiman 1983: 799–800, Gramley 1987; cited in Rohdenburg 1995: 367). Thus, non-finite complements, which tend to exhibit more syntactic integration with the matrix clause, are typically also temporally and conceptually dependent on that clause.

Figure 1: Semantic and conceptual categorization of complementation patterns (based on Dixon 2006: 23, Givón 1990, Verspoor 2000).²

While these principles evidently form an overgeneralization of the linguistic reality, they do offer more background to the action/fact discussion in the context of nominal and verbal gerunds. First of all, they make explicit the link between the semantics of activity and factivity on the one hand, and the formal make-up of a construction on the other: the less finite a construction, the likelier it will be action-referring. Secondly, the literature on complementation provides us with additional predictions about the conceptual nature of different complement types, in that finite forms are typically associated with conceptual distance and temporal independence, while less finite (or more nominalized) forms are argued to evoke more conceptual and temporal integration with the main clause.

Based on the literature outlined above, the collocational analysis of direct objects/complements that is carried out in this paper will focus on the following questions:

- (i) Do nominal and verbal gerunds combine with typical “containers” that are reflective of their status as state-of-affairs or propositions? More specifically, do nominal gerunds combine with predicates that are typically followed by an action referring complement (e.g. *observe*) and verbal gerunds with factive predicates (e.g. *regret*)?

² While most studies only focus on the traditional clausal complement types, Verspoor (2000: 203) mentions nominal-lexical structures as ranking lowest on a scale of finiteness, therefore displaying the highest degree of conceptual integration when occurring in the direct object slot.

- (ii) Do nominal and verbal gerunds conform to the binding-hierarchy, i.e. do verbal gerunds, as the more “finite” form, show more conceptual distance to the semantics of the main clause, while nominal gerunds are more conceptually integrated in terms of time reference and meaning?

I will furthermore address the semantic profiles of nominal and verbal gerunds that have emerged from referential studies, with special attention to Fonteyn, Heyvaert & Maekelberghe (2015) and Maekelberghe (forthc.). Their observations are significantly different from the descriptions that are offered in the (typological) literature on complementation, as they consider verbal gerunds to be conceptually dependent constructions and nominal gerunds the conceptually independent ones. Based on the referential studies outlined in Section 2, I will address the following questions:

- (iii) Are nominal gerunds attracted to main verbs that are typically non-controlled and followed by an existentially presupposed entity?
- (iv) Are verbal gerunds more likely to occur in subject-controlled contexts and with main verbs that are more flexible with regard to their existential status?

4.2. Results

In contrast to most studies that make use of collocation analyses, I have not focused on lexemes that are attracted to the constructions themselves, but on the matrix clause predicates that occur with these constructions. Moreover, as opposed to regular collocational analyses, which reveal which collocates are attracted to each construction separately, the distinctive collexeme analysis allows us to “abstract away from frequent elements that are common to both investigated constructions and highlights those elements that are distinctive for each respective construction” (Hilpert 2006: 144). This distinctive collexeme analysis was carried out using Stefan Th. Gries’ collocation analysis 3.2 R-script, which yields a list of lexemes that are ranked according to a value of collocation strength.³ The results of the analysis are summarized in Table 1: for each lexeme, the observed frequencies with nominal and verbal gerunds respectively are given, followed by its value of collocation strength. In order to maintain some overview, only lexemes that are attested more than five times in the dataset are listed.⁴

Nominal gerund (N=844)		Verbal gerund (N=3253)	
Collexeme	Coll. strength	Collexeme	Coll. strength
oversee (21:0)	14.53	consider (1:305)	29.90
allow (29:7)	13.85	try (0:195)	19.96

³ This value is based on the $-\log_{10}$ transformation of the p-values that are provided by the Fisher-Yates exact test.

⁴ Table (i) in the appendix provides a raw frequency list of all predicates that were attested with nominal and verbal gerunds and which served as input for the distinctive collexeme analysis.

facilitate (26:9)	11.01	avoid (5:243)	18.46
improve (13:0)	8.97	enjoy (1:144)	13.13
accelerate (12:0)	8.28	love (0:125)	12.67
promote (15:3)	7.72	recommend (3:135)	10.06
follow (11:0)	7.59	risk (1:110)	9.74
enable (13:2)	7.13	suggest (2:120)	9.61
encourage (14:3)	7.11	remember (6:144)	8.45
announce (10:0)	6.90	like (2:105)	8.18
ban (13:8)	6.50	imagine (4:118)	7.65
complete (8:0)	5.51	mind (0:76)	7.65
forbid (10:3)	4.70	propose (2:77)	5.58
influence (8:1)	4.64	report (2:73)	5.22
affect (6:0)	4.13	resist (0:46)	4.61
criticize (6:0)	4.13	involve (28:221)	4.27
enhance (6:0)	4.13	deny (0:27)	2.7
address (8:2)	4.03	fear (0:24)	2.4
order (8:2)	4.03	prefer (0:24)	2.4
aid (5:0)	3.44	regret (0:20)	1.99
condemn (5:0)	3.44	favor (2:33)	1.80
demand (5:0)	3.44	advise (0:18)	1.80
supervise (5:0)	3.44	hate (0:18)	1.80
increase (6:1)	3.37	recall (5:48)	1.59
prohibit (9:5)	3.34	envision (0:15)	1.50
protest (7:3)	3.00	admit (0:14)	1.40

Table 2: Matrix verb predicates attracted to nominal vs. verbal gerunds.

Interestingly, we find relatively little overlap between the verbs that occur with nominal and verbal gerunds: out of the lexemes that served as input for the collexeme analysis, only 25% are shared between nominal and verbal gerunds. Nominal and verbal gerunds thus clearly differ in their distributional patternings, which confirms that there must be a semantic difference between both constructions. Let us now consider these results in light of the semantic descriptions that were offered in previous studies, starting with the distinction between actions/state-of-affairs and facts/propositions. Let me thereby emphasize once again that I do not define facts in their strictest sense, i.e. as situations that are presupposed true, but rather as propositions, which represent situations that can be evaluated according to their truth value but do not need to be true as such (e.g. *I thought that John would have been home, but he wasn't*). Secondly, just because the gerund combines with a factive predicate does not mean it represents a fact or a proposition itself. Consider, for instance, the difference between (28a) and (28b).

According to Dixon (2006: 28), in (28a) the speaker remembers “the fact that something happened”, while in (28b), he or she remembers “the details of the activity involved”. We should, therefore, keep in mind that combining with a factive predicate is not necessarily an indicator for the propositional status of the complement.

- (28) a. I remembered that I had visited Paris
- b. I remembered visiting Paris (Dixon 2006: 28)

In what follows, I will first discuss the semantic types of predicates found with **verbal gerunds**, claiming that the action-fact distinction is not as visible as one might expect. That factive predicates do not necessarily imply a propositional reading of their complements becomes immediately clear when we look at some of the factive verbs that can be found Table 2. While predicates like *regret*, *admit*, *mind*, *remember*, *recall* and *deny* are typically considered to be factive (cf. Kiparsky & Kiparsky 1970), the verbal gerunds that combine with them do not always appear to conceptualize facts or propositions. The small minority of verbal gerunds that combine with an explicit oblique subject, as in (29), are likelier to conceptualize propositions, but this is less obvious with the verbal gerund in (30), which does not allow for epistemic modification (*?I don't mind perhaps fighting you in open space*). The same goes for the verbal gerunds in (31) and (32), which refer to past situations, but could be argued to refer to events rather than propositions. Note moreover that the latter two examples do not maintain their truth value under negation, which would be expected if they denote facts; instead, the hearer will more likely interpret the situations expressed by the verbal gerunds in (31) and (32) (*noticing her taking them*; *seeing the dress*) as having never occurred.

- (29) In fact, I recall *him taking a trip to Afghanistan prior to taking this job at his own expense and at considerable risk*.
- (30) I don't mind *fighting you in open space*, but I hate to put you in a corner.
- (31) If you look at most of the pictures my mother took of us, you'll see we're not looking at the camera. I don't even remember *noticing her taking them*, so it never got irritating.
- (32) Pancho didn't recall *seeing the dress before*; Mandy must have bought it in one of Selene's shops.

Rather than centering around factivity, the types of predicates typically combining with verbal gerunds are a good reflection of the variety of semantic clusters that have been associated with gerundive complementation in general (see De Smet 2013 for an overview), such as negative implicative verbs (*avoid*, *resist*), emotive verbs (*like*, *enjoy*) and proposal verbs (*recommend*, *suggest*, *propose*). In contrast to factive verbs, these verbs are less likely to impose a propositional reading on their

complements. It is not immediately clear, for instance, whether the predicates in (33)–(35) are followed by situations that represent something that might *occur* (i.e., a state-of-affairs), or, whether they are followed by a situation that has *truth value* (i.e., a proposition). While the verbal gerund with oblique subject in (33) is more likely to receive a propositional interpretation, the verbal gerunds in (34)–(35) more readily invite an action-referring interpretation. This ambiguity might be attributed to the fact that these predicates, as opposed to factive predicates, do not refer to past situations, but typically create virtual mental spaces, containing counterfactual, hypothetical or future situations.

- (33) You will look elegant enough before your clients, but the pale color will prevent *you overstepping your bounds as a tradesman* and offending them.
- (34) Fortunately, he managed to avoid *shattering the lantern*.
- (35) I suggest *contacting the manufacturer* or taking the amp to a repairman.

The predicates that combine with **nominal gerunds** can likewise be divided into a number of semantic types, which center on factivity, action semantics and modal meaning. It can first of all be observed that the nominal gerund's alleged action-referring status does not prevent it from combining with factive predicates; witness for instance the examples with *criticize*, *condemn* and *protest*.

- (36) I have condemned *this killing of people* and using live ammunition to kill people .
- (37) She spent years protesting *the jailing of dissidents*.

Yet, similar to the verbal gerunds in (30)–(32), the situations referred to by the nominal gerunds do not receive a purely propositional interpretation (“the fact that people have been killed”, “the fact that dissidents are jailed”), but appear to retain a more eventive reading (“the act of killing people”, “the act of jailing dissidents”), i.e. they represent situations that can be said to occur.

Other verbs, then, more clearly emphasize the action-referring status of the nominal gerund. Lexemes like *oversee* and *follow*, for instance, were already mentioned in Vendler (1968) as typical containers for nominal gerunds. Similar verbs include *supervise*, *accelerate* and *complete*.

- (38) The current president Lee Myung-bak oversaw *the replanting of millions of trees around the capital*.
- (39) Maybe, but that's better than the endless quarreling between Adam and Eve that follows *the eating of the forbidden fruit* in the ninth book of Paradise Lost.
- (40) The auction site, in fact, accelerated *the faking of antiquities for the international art market*.
- (41) Sir Charles would be supervising *the swapping of the steam engines and generators*.

- (42) She wouldn't let me complete *the tuning of the strings* until you were here to share this with us, John.

Another semantic cluster that is attested with nominal gerunds involves modal meaning. Examples (43a–b) illustrate two predicates with deontic modality (other lexemes include *ban*, *order*, *demand* and *forbid*), while (44a–b) provides examples with a more force-dynamic meaning. While these types of predicates can be considered strong indicators of a state-of-affairs complement, they do not emphasize the action-referring status of the nominal gerund in the same way as the predicates in (38)–(42) did.

- (43) a. While his appeal was pending, the government changed its regulation, allowing *the carrying of loaded firearms on federal land whenever that conduct is permitted under state law*.
b. New rules prohibited *the selling of glass bottles and fried foods*.
- (44) a. (...) love is often considered to reside deep within people's hearts, at the core of mentality and spirituality, where it has traditionally been thought to affect *the healing of mind, body, and soul*.
b. A clean energy bank, like the one included in the House and Senate bills, could be the mechanism to enable *the appropriate sharing of risk*.

If we consider these observations in light of the traditional dichotomy between actions and facts (or state-of-affairs and propositions), we can conclude that a collexeme analysis of nominal and verbal gerunds problematizes the traditional dichotomy in two ways. First of all, it shows that the distinction between actions and facts does not appear to be relevant in certain contexts, or, that the distinction is at least not very pronounced, witness, for instance, the use of both nominal and verbal gerunds with factive predicates in examples (29)–(32) and (36)–(37). Both nominal and verbal gerunds combine with a broader range of predicates that do not necessarily emphasize the action or fact status of its complement, but focus on other aspects of its meaning, e.g. the verbal gerund's status as a 'realis' or 'irrealis' situation with negative implicative verbs or the semantics of force-dynamics with nominal gerunds. Moreover, when they combine with factive predicates, both gerund types do not establish a clearly propositional meaning, but instead retain their eventive semantics. This leads us to the second issue, which lies at the core of the problems that traditional analyses are faced with. If we assume a privative semantic opposition between nominal and verbal gerunds – i.e. both nominal and verbal gerunds can denote actions, but verbal gerunds can also denote facts – this leaves open the question of what exactly distinguishes eventive nominal gerunds from eventive verbal gerunds.

I argue that we should move away from the labels of action and fact, which are at the same time too specific and too vague, and instead situate the distinction between nominal and verbal gerunds on a more abstract, conceptual level. The primary indicator for this conceptual distinction is the distinct

control behavior of nominal and verbal gerunds: while the implicit subject of verbal gerunds is typically coreferential with the subject of the matrix clause, i.e. the verbal gerund is subject-controlled, nominal gerunds typically lack such a control relation, witness for instance examples (30)–(32) vs. (43)–(44).

In fact, this fundamentally different control behavior seems to be the only aspect that unites the various subtypes of matrix predicates that are typically attracted to nominal vs. verbal gerunds. All verbs that are listed with nominal gerunds tend to display a non-controlled pattern, while verbs attracted to verbal gerunds typically have a subject-controlled complement, with the exception of verbs of suggestion. This distinction roughly corresponds to what Thompson (1973: 381) calls “private” vs. “public” predicates. The former includes predicates that “involve an individual and his private thoughts, feelings, and personal welfare” and are typically subject-controlled, while the latter describe activities “which [are] generally shared” (ibid.) and therefore tend to lack such control relations. A second potential generalization involves the temporal orientation of the matrix predicates. The majority of predicates that are attracted to nominal gerunds are generally followed by situations or events that have already taken place or are taking place at that moment, i.e. they are “same-time” or “backward-referring” predicates (Egan 2008: 39). Interestingly, looking at the predicates from a temporal point of view allows us to surpass the traditional distinction between action and fact, as both the action-referring and factive predicates listed above can be considered same-time or backward-referring (see, for instance, *oversee*, *accelerate*, *follow*, *complete* as well as *condemn*, *criticize*, *protest*). Verbal gerunds, on the other hand, show more versatility, combining quite often with virtual space-building verbs such as *imagine*, *propose*, *resist* and *risk*, but also with backward-referring verbs as *remember*, *recall*, *report* and *admit* as well as verbs that allow for both interpretations, like *enjoy*, *hate* and *try*.

It follows, then, that the semantics of the gerund construction itself is of a more abstract nature, which, I argue, largely corresponds to its prototypical referential behavior. In line with the referential strategies which they typically employ, nominal gerunds prefer verbs that lack subject coreferentiality, while verbal gerunds tend to be controlled by the subject of the predicates they attract. Secondly, in accordance with their preferred existential status, nominal gerunds are shown to be embedded more often in contexts that refer to past or present situations, while verbal gerunds do not appear to prefer verbs with a particular temporal orientation.

Finally, the results discussed above suggest that the so-called “binding hierarchy” of complement types, which ranks complement clauses according to their degree of conceptual dependence on the matrix clause, cannot be readily applied to nominal and verbal gerunds. Contrary to what one might expect at first, nominal gerunds, as the “less finite” form, are typically more conceptually independent from their matrix clause – as evidenced by the lack of control relations – while verbal gerunds display more conceptual integration. A similar observation is made in Duffley (2014: 149–150), who investigates control patterns with *to*-infinitives, verbal gerunds and deverbal nouns such as the nominal gerund. He points out that “as far as control is concerned, the scale runs in exactly the opposite direction: it is the *to*-infinitive that exhibits the greatest degree of event integration, with a lesser degree

of notional binding being found with the gerund-participle [verbal gerund, CM], and an even lower degree with the deverbal noun”. It should be noted, however, that while nominal gerunds indeed rank lower than verbal gerunds with regard to their degree of *clausal* finiteness, they do dispose of more *nominal* grounding elements, i.e. determination. Consequently, nominal gerunds do not need to rely on matrix clause elements to receive spatiotemporal grounding, which in turn lends them more conceptual independence from this matrix clause. Thus, rather than refuting the binding hierarchy, I argue that it is the ranking of nominal and verbal gerunds on a scale of clausal finiteness that is inaccurate.

5. Noun complements

In contrast to gerunds in the direct object or complement position, which have received a fair amount of attention in previous studies, gerunds functioning as nominal complements are as yet an underresearched area. Still, they are interesting for several reasons. First of all, noun complementation is found quite often with gerunds, especially with verbal gerunds, and could provide us with another perspective on their semantics. Secondly, just as verbal complements derive a great deal of their semantics from that of the matrix clause predicate, nominal complements can be influenced by the semantics of their head noun as well. As such, it will be interesting to see which types of nouns are attracted to nominal gerunds as opposed to verbal gerunds, and what this might reveal about the semantics of the gerund construction itself.

A distinction can be made between two types of N + PREPOSITION + GERUND constructions, viz. either the gerund functions as postmodifier, as in (45), or it is a nominal complement, as in (46) (Huddleston & Pullum 2002, Keizer 2007: 65).

- (45) This institute is located in Albuquerque, New Mexico and has a new facility for the teaching of flamenco dance. (COCA)
- (46) (...) this recollection of the first crossing of the Atlantic by Christopher Columbus 500 years ago (...). (BNC)

While it is not always easy to draw the line between postmodification and complementation, I have decided to exclude clearly postmodifying uses, as they establish a weaker semantic link between the head noun and its prepositional complement. While postmodifiers serve to “enrich” the information provided by the head noun, complements are typically “licensed” by the head noun and thus “complete” rather than enrich the meaning of the noun phrase (Keizer 2007: 65). Accordingly, nouns that are followed by a complement are of a more relational nature, i.e., their valency and meaning allow them to create arguments that are needed to complement their semantics and on which they are conceptually dependent (Langacker 1987: 277, Davidse 2015). In (46), for instance, the noun “recollection” evokes an empty argument indicating “the thing that is recollected”, while the same does not immediately hold for “facility”.

Within the category of noun complementation, we can discern two subtypes, viz. appositional and non-appositional constructions, as illustrated in examples (47)–(48). In the case of appositional complements, the head noun and its complement are characterized by a relation of “identity of reference” (Quirk et al. 1985). In (47), for instance, the situation described by the verbal gerund – “examining the hiring bias issue” – is conceptualized as a “task”, meaning that both the head noun and its complement essentially refer to the same concept, which is confirmed by the fact that the noun “task” can be omitted without changing the meaning of the sentence. Non-appositional constructions such as (48), on the other hand, do not involve such a relation. Indeed, the activity of “shooting lions” is not conceptualized as a “ban”, but rather as something that is the object of the ban. Both appositional and non-appositional uses have been included in this study. Furthermore, I have decided to include a number of constructions that could also be classified as complex subordinators, such as *in the process of* or *in response to* in examples (49) and (50), since I believe that these constructions still interact with their complements on a semantic level despite their different lexicogrammatical status.

- (47) His faith-based task force (consisting of people from both sides of the debate) was not charged with the task of *examining the hiring bias issue*.
- (48) (...) a statewide ban on *the Sunday retailing of alcohol*.
- (49) About 800 to 900 American families are right now in the process of *adopting kids from Haiti*.
- (50) In response to *the killing of Treyvon Martin in Florida* (...).

The results of the distinctive collexeme analysis are presented in Table 3. This time, for reasons of space, only lexemes that occur more than once in the datasets are listed.⁵

Nominal gerund (N=360)		Verbal gerund (N=8415)	
Collexeme	Coll. strength	Collexeme	Coll. strength
evidence (6:0)	8.25	way (0:417)	8.02
anniversary (6:1)	7.42	idea (0:275)	5.25
criticism (5:2)	5.58	chance (0:169)	3.20
ban (7:10)	5.50	process (2:243)	2.80
story (6:14)	3.88	hope (0:145)	2.74
call (4:4)	3.71	difficulty (0:127)	2.40
need (3:2)	3.15	interest (0:127)	2.40
occasion (3:2)	3.15	mean (0:124)	2.34

⁵ Especially with nominal gerunds, we find many instances that occur only once with the nominal gerund but are not attested with verbal gerunds, resulting in a significant value of collostructional strength. In order to maintain some overview, however, I have decided to exclude these instances from Table 3.

account (3:3)	2.86	method (2:206)	2.21
contribution (4:9)	2.77	job (0:106)	2.00
anger (2:0)	2.74	strategy (0:105)	1.98
control (2:0)	2.74	risk (0:103)	1.94
documentary (2:0)	2.74	goal (1:147)	1.92
end (2:0)	2.74	cost (1:146)	1.90
film (2:0)	2.74	possibility (0:92)	1.73
increase (2:0)	2.74	purpose (0:92)	1.73
inquiry (2:0)	2.74	task (0:89)	1.68
outrage (2:0)	2.74	importance (2:162)	1.56
site (2:0)	2.74	benefit (0:80)	1.50
retaliation (2:0)	2.74		
result (6:28)	2.56		
apology (2:1)	2.28		
decrease (2:1)	2.28		
regulation (2:1)	2.28		
revenge (2:1)	2.28		
aftermath (2:2)	1.99		
belief (2:2)	1.99		
response (2:2)	1.99		
question (5:27)	1.98		
concern (5:29)	1.87		
blame (2:3)	1.78		
book (2:3)	1.78		
demand (2:3)	1.78		
explanation (2:4)	1.62		
study (2:4)	1.62		
involvement (2:5)	1.49		
issue (4:26)	1.44		
skill (4:27)	1.39		

Table 3: Head nouns attracted to nominal vs. verbal gerunds.

As was also the case for the collexeme analysis of predicates, we find very little overlap between nouns that are attracted to nominal vs. verbal gerunds: only 20% of all nouns in the datasets were shared between both constructions. Note, moreover, that because there is a large difference between the frequency of nominal gerund complements and verbal gerund complements, lower frequency items with nominal gerunds still receive a significant value of collostructional strength, while nouns that combine

with verbal gerunds need to occur quite often in order to be significantly attracted. For sake of clarity, Table (i) in the appendix provides a raw frequency list of nouns that combine with nominal and verbal gerunds based on the input files. It should also be remarked that while verbal gerunds typically combine with head nouns that are followed by an *of*-phrase, nominal gerunds combine with a broader range of prepositions (e.g. *ban on*, *call/need for*, *outrage at*). This can be mainly attributed to the so-called “horror aequi” principle, which posits that language users have a tendency to avoid identical and adjacent grammatical elements, in this case the repetition of the preposition *of* with nominal gerunds.

While much attention has been devoted to the lexicogrammatical status of various types of noun postmodification or complementation (see, for instance, Quirk et al. 1985, Huddleston & Pullum 2002, Biber et al. 1999, Keizer 2007), semantic typologies are, in contrast to verb complementation, not widespread. For this analysis, I will draw on Schmid’s (2000) semantic classification of so-called shell nouns, i.e. “abstract nouns that have (...) the potential for being used as conceptual shells for complex, proposition-like pieces of information” (2000: 4), such as the noun *problem* in example (51).

- (51) The (big) problem was that I had no money. (Schmid 2000: 3)

Even though not all nouns listed in Table 3 qualify as shell nouns, the semantic classification is nonetheless largely applicable. In addition to factual and eventive nouns, as in examples (52)–(53), Schmid discerns linguistic (54), mental (55), modal (56) and circumstantial (57) uses. Each example illustrates just one of a number of subtypes that are distinguished for each semantic function.

- (52) ... if it is really serious about the **problem** of global warming. (BBC, Schmid 2000: 125) [Factual: attitudinal]
- (53) The first **action** was to place the vessel under cover and remove the deckhouse. (MAGS, Schmid 2000: 263). [Eventive: general]
- (54) (...) the ageless **observation** that football is a funny old game. (TODAY, Schmid 2000: 155) [Linguistic: Illocutionary]
- (55) Nobody likes the **idea** of aborting elephants but, on reflection, surely it is preferable to slaughtering adults. (NEWSCI, Schmid 2000: 192) [Mental: conceptual]
- (56) (...) the **likelihood** that they will consume rust particles. (PAPERS, Schmid 2000: 241) [Modal: epistemic]
- (57) We are winning against drugs but the only foolproof **way** is to bring in blood tests. (PAPERS, Schmid 2000: 286) [Circumstantial: general]

Interestingly, it can be observed that the majority of nouns occurring with nominal gerunds can be classified as factual nouns, which are typically followed by presupposed complement clauses (see also Davidse 2015). Examples include evidential nouns like *evidence*, attitudinal uses like *criticism*, *anger*,

outrage, retaliation, apology, revenge, concern and blame, causal uses like *result, aftermath* and *response* and nouns that do not readily fit into Schmid's classification, but which are typically followed by presupposed entities, such as *inquiry, contribution, involvement* and, to a lesser extent, *regulation* and *ban*. As was the case with factive predicates, however, this does not necessarily mean that the complement is a fact or proposition. The nominal gerund in example (62), for instance, is clearly more action-referring than propositional, as it refers to an event that occurs in the past, present and/or future, without representing it as a piece of information about the world that may be evaluated in terms of its truth value.

- (58) Some of the many items they found show distinct evidence of *the blending of cultural traditions*.
- (59) Mr. Karoui's public apology over *the airing of Persepolis*.
- (60) The result of *this pillaging of productive farmland* has meant the end of Zimbabwe's commercial agriculture.
- (61) (...) it was Moscow that had made a decisive contribution to *the dismantling of the world communist system* through the work of Mikhail Gorbachev and, later, Boris Yeltsin.
- (62) Under new legislation, the FAA is being order (*sic*) to drop regulations for *the testing and licensing of commercial drones* by 2015.

Closely related to these factual uses are a group of nouns represented by *explanation, account, story, documentary, film* and *book*. While the first three nouns could be classified as linguistic, illocutionary uses, they are not necessarily followed by reported utterances, as is the case in Schmid's classification. Witness, for instance, the difference between examples (63) and (64):

- (63) I didn't buy the story that you were a specter.
- (64) What's the story of the writing of that song?

Instead, I propose that these nouns constitute a subtype of factual nouns, which are characterized by an increased degree of "conceptual distance". While there was still a certain link between the contents of the complement and that of the noun with the factual nouns in examples (58)–(62), such as a certain attitude ("apology") or a causal relation ("result"), this subtype typically lacks such conceptual overlap.⁶

⁶ It could also be argued that these examples represent instances of postmodification rather than complementation. While they are definitely borderline cases, I have decided to include them because nouns like *documentary, film* and *story* imply the existence of a certain subject matter and as such license the following prepositional complement.

In example (65), the situation described by the nominal gerund can hardly be argued to interact with the semantics of the head noun *documentary*; it merely represents what the documentary is about.

- (65) (...) the premiere of the documentary about *the making of Bruce Springsteen's album*.

A third and fourth type of nouns that are attracted to nominal gerunds are typically followed by more eventive complements. The third type includes modal, deontic uses represented by nouns as *call*, *need* and *demand*, as illustrated in example (66), while the fourth type includes temporally-oriented eventive nouns such as *end*, *increase* and *decrease*, as in (67). While the former type is typically followed by non-presupposed complements, the latter is followed by existentially actual(izing) situations.

- (66) There has been no call for *the severing of the relationship between the United States and Afghanistan*.
- (67) Rising global demand for the pines for wood for large-scale construction projects and for garden furniture led to a huge increase in *logging of the trees in Amur tiger range*.

A last subtype that fits into Schmid's semantic typology are circumstantial uses, represented here by the nouns *anniversary* and *site*, which respectively focus on the time and place of the situation in the complement. Interestingly, these circumstantial uses typically involve so-called "historic nominal gerunds" (cf. Fonteyn 2016b, Maekelberghe forthc.), i.e. nominal gerunds that refer to a historic event which has a fixed position in time and space. I will come back to the particular status of these constructions in Section 6.

- (68) Today is the 200th anniversary of *the signing of the Bill of Rights*.
- (69) (...) the historical site of *the miraculous turning of water into wine by Jesus* (...).

Importantly, there is a clear tendency for nominal gerunds to occur in non-appositional contexts where there is an absence of identity of reference between the head noun and its complement, the only exceptions being nominal gerunds that combine with the nouns *occasion* and *issue*, as in examples (70)–(71). Their appositional structure can be evidenced by the fact that the head noun can be omitted without changing the meaning of the sentence:

- (70) More times than not, "the exercises on the occasion of *the opening of the Orphan Asylum* occupied the greater part of the day" (...).
- (71) Are you going to emphasize the issue of *protecting of women*?

The analysis of verbal gerunds, then, while yielding fewer significantly attracted collexemes, reveals a variety of semantic subtypes as well. First of all, there appear to be no unambiguously factual uses. While nouns as *difficulty*, *importance* and *benefit* can occur with factive complements, as in (72), they also frequently occur in a more eventive sense, as in (73).⁷

(72) So, you know, I have the benefit of *knowing the complexities of all these kids*.

(73) The benefit of *hiking with guides* is that they are experienced at pointing out the differences between the live oaks, persimmon, cedar and ash juniper trees.

An unambiguously eventive use is represented by the noun *process*, which, as mentioned earlier, can also occur as complex subordinator under the form *in the process of*.

(74) I know that Michelle went through the process of *closing schools in, in Washington, D.C.*

(75) she and her husband Jesse were in the process of *adopting this little boy*.

Secondly, a number of modal uses can be discerned. While *possibility* and *risk* can be classified as epistemic, the nouns *job* and *task* are analyzed by Schmid as deontic uses. The noun *chance* can represent both epistemic (78) or dynamic (79) modal uses.

(76) The Chinese government is exploring the possibility of *granting paid paternity leave in Hong Kong*.

(77) Coaches understand that once a program is successfully built, the momentum often continues, making the job of *attracting top recruits and producing winning teams* more sustainable.

(78) The hooks pull free of the bait when you strike and embed in the muskie's mouth, reducing the chance of *gut-hooking the fish*.

(79) The walking would be easier, and he would at least have the chance of *encountering other travelers*.

A third type involves circumstantial uses, as illustrated by the nouns *way*, *mean*, *method* and, to a lesser extent, *strategy*. While the circumstantial nouns with nominal gerunds were of a more specific nature, pointing to the time and place of the situation described in the complement, circumstantial nouns with verbal gerunds are more general and are therefore often complemented by generic events, as in (80).

⁷ Because the collocational analysis has not taken into account the various senses that can be expressed by particular nouns, I cannot give any figures with regard to the distribution of factual vs. eventive uses with these nouns.

- (80) It was a way of *exercising power and control in the relationship*.

A final subtype is represented by mental uses, a semantic class that is not found with nominal gerunds. Two specific uses are attested with verbal gerunds, viz. volitional nouns as *goal*, *purpose* and *hope* and the conceptual noun *idea*. Just like modal and circumstantial uses, mental nouns are typically complemented by situations that express activities rather than facts (Schmid 2000: 276).

- (81) I set myself the goal of *making three new friends*.

- (82) I was actually toying with the idea of *picking his pocket* when a noise to the other side of my barrel told me someone was lurking there.

With regard to the distinction appositional vs. non-appositional, we can observe that noun complementation with verbal gerunds may involve identity of reference, as is mostly the case with nouns like *job* and *task*, as well as the noun *possibility* in example (76), which could be omitted without drastically changing the meaning of the sentence.

What does this tell us about the semantics of gerunds in general? First of all, the collexeme analysis of N+preposition+gerund constructions confirms my earlier finding that the action-fact dichotomy does not capture the actual distribution of nominal and verbal gerunds. It is the nominal gerund that prefers factual nouns (even though these are not necessarily followed by propositional complements), while verbal gerunds display more action-referring uses, as evidenced by the frequency of eventive as well as circumstantial and mental nouns. We do, however, find further evidence of the claims made in previous referential studies. In Fonteyn, Heyvaert & Maekelberghe (2015), it is argued that nominal gerunds resemble prototypical nouns in that they are typically conceptually independent from contextual elements to establish reference and tend to refer to situations as being existentially presupposed. Verbal gerunds, on the other hand, are described as conceptually dependent and existentially flexible constructions, thus resembling prototypical verbs. This is confirmed by collexeme analysis of noun complement constructions: nominal gerunds seem to prefer contexts that refer to past or present situations, while verbal gerunds are more common with lexemes that build virtual spaces. Secondly, the analysis of noun complementation constructions has shown that nominal gerunds prefer non-appositional structures, typically displaying a higher degree of conceptual distance towards the head noun, while verbal gerunds are attracted to (semi-)appositional structures which exhibit more conceptual overlap between the head noun and its complement. More specifically, the situations described by verbal gerunds can be represented as a ‘possibility’, ‘task’, ‘difficulty’, ‘risk’, ‘goal’, ‘idea’ etc. The same does not hold for a large number of nominal gerunds, which cannot be said to conceptualize a ‘ban’, ‘account’, ‘anniversary’ or ‘evidence’.

In the next section, I will explore how the results of this collocational study can contribute to a more nuanced and fine-grained picture of the semantics of gerunds.

6. Towards a dynamic semantics

For years, researchers have attributed a static distinction between actions and facts to the semantics of gerund constructions, thereby disregarding the variety of contexts the gerund occurs in. The collocational stance taken in this paper has shown that this distinction is an oversimplification of the linguistic reality and has above all revealed that nominal and verbal gerunds themselves do not have a well-defined and well-delineated semantic profile, but are instead characterized by a number of abstract, conceptual features that can be filled in more concretely by specific contextual slots. By mapping out these distributional preferences, the collocational analysis can contribute to a more nuanced view on the gerund's semantics. This is illustrated in Figure 2, which further elaborates the comparison made by referential studies between nominal and verbal gerunds on the one hand, and prototypical nouns and verbs on the other. While prototypical nouns typically conceptualize autonomous, enduring **entities** of which the existence is presupposed, prototypical verbs profile the **interactions** between these entities (Langacker 1991, 2002, 2009). To refer to a meaningful interaction, they are conceptually dependent on the clausal context. Rather than being time-stable, interactions refer to transient processes: “they take a certain span of time to occur and then are gone forever” (Langacker 2002: 32).

By means of a number of concrete examples, Figure 2 visualizes how particular collocates can highlight or downplay the prototypical profile of nominal and verbal gerunds, thus resulting in a cline from conceptually noun-like to verb-like uses. A “prototypical” nominal gerund could, for instance, be illustrated by the example “a story about the planting of oak trees”, as it presents a conceptually independent and time-stable entity. These features are emphasized more clearly by the noun “anniversary” and the accompanying historic nominal gerund in a construction like “the anniversary of the lifting of the iron curtain”. Instances like these do not derive their temporal and spatial location from the context, but are characterized by an inherent spatiotemporal orientation (most of us approximately know when and where “the lifting of the iron curtain” has taken place). Because of this fundamental conceptual independence and existential presupposition, historic nominal gerunds most closely resemble prototypical nouns. Action-referring predicates such as “accelerate”, on the other hand, downplay the temporal stability or presupposition of the nominal gerund, and conceptualize it as a process unfolding over time. One could argue, then, that these nominal gerunds exhibit more conceptually verbal traits.

The abstract features that have been attributed to verbal gerunds involve the notions of conceptual integration or dependence and temporal flexibility. This is clearly illustrated in an example like “the grandparents tried/regretted/imagined buying a stuffed lamb”. Rather than showing a preference for a factive verb like “regret”, verbal gerunds frequently combine with all three predicates, which are typically subject-controlled and set up a specific temporal and modal space. On the more noun-like end of the cline we find examples like “it involves building bridges”, where we find less conceptual overlap between the semantics of the predicate and its complement (no control relation) but which still evoke a processual meaning. Finally, verbal gerunds often combine with lexemes that impose a generic reading on their complements, such as “the method of collecting taxes”. Instances like these

could be argued to represent the most noun-like use of the verbal gerunds, as they reflect the time-stable conceptual profile that is typical of regular abstract nouns.

Figure 2: A distributional perspective on the noun-verb cline with nominal and verbal gerunds.

Figure 2 not only shows the dynamic interactions between gerund constructions and their context, it can also shed light on differences between nominal and verbal gerunds that might not be obvious at first. Even though it is perfectly possible to form an utterance like “a story about planting oak trees”, the lexeme “story” instead appears to be attracted to nominal gerunds because it implies greater conceptual distance. As such, the cline presented in Figure 2 can provide an answer to the question that is left open in traditional analyses, namely what exactly constitutes the difference between action-referring nominal and verbal gerunds.

7. Conclusion

This paper set out to investigate the semantics of the English gerund by means of a collocational analysis. On the one hand, it aimed to reassess two semantic labels that have often been attributed to gerunds, viz. those of action and fact. On the other, it wished to complement more functionally-oriented referential studies with a thorough distributional analysis. This was accomplished by means of a distinctive collexeme analysis, which looked at the types of predicates and head nouns that combine with one gerund type as opposed to the other. My analysis first of all showed that there is overall little overlap between the distributional preferences of nominal and verbal gerunds, confirming that both gerund constructions have a fundamentally different semantic profile. Secondly, it pointed out that the action-fact dichotomy fails to capture the semantic distinction between nominal and verbal gerunds. With both predicates and head nouns, I discerned a vast array of semantic subtypes which illustrated that the distinction between actions and facts is often irrelevant. As for the matrix clause predicates, the main

distinctions between nominal and verbal gerunds were especially concerned with different control behavior, more specifically no subject coreferentiality with nominal gerunds and subject- or object-controlled verbs with verbal gerunds, and secondly, a different temporal orientation, with nominal gerunds preferring same-time or backward-referring predicates, while verbal gerunds displayed no clear preference for a particular temporal orientation. In noun complement constructions, as well, nominal and verbal gerunds were shown to combine with a broad range of head nouns, including factual, modal, circumstantial, eventive and mental uses. While the majority of nouns attracted to nominal gerunds fell into the factual class, verbal gerunds combined with circumstantial, modal as well as mental nouns. With regard to temporal orientation, it could again be observed that nominal gerunds more often occurred in existentially presupposed contexts, whereas verbal gerunds exhibited a preference for virtual space-building nouns. On a more structural level, I found that nominal gerunds are more frequent in non-appositional structures, while verbal gerunds show a tendency towards appositional uses.

These observations, I showed, complement the nominal and verbal gerund's respective referential profiles, as described in Fonteyn, Heyvaert & Maekelberghe (2015) and Maekelberghe (forthc.). The referential studies centered around two notions, viz. conceptual (in)dependence and existential status. From a distributional perspective, the notion of conceptual (in)dependence is reflected in the typical control relations established by the predicates that are attracted to nominal and verbal gerunds as well as the degree of conceptual overlap between the noun and its complement in (non-)appositional structures. With regard to these two features, nominal gerunds clearly emerge as the conceptually independent form, while verbal gerunds display more conceptually dependent traits. The gerund's existential status, on the other hand, goes hand in hand with the temporal orientation of the predicate or head noun it combines with. As such, nominal gerunds were shown to prefer same-time and especially backward-referring contexts, which is in accordance with their existentially presupposed status. Verbal gerunds exhibited more flexibility on the existential level, often combining with lexemes that build virtual (i.e. future, hypothetical or counterfactual) spaces.

In addition to their *referential* profiles, the distributional preferences of nominal and verbal gerunds can also be linked to their *formal* make-up. Nominal gerunds, for instance, overwhelmingly occur with a definite article (Maekelberghe forthc.), the influence of which is not only manifested on a referential level, but also trickles down into the nominal gerund's distributional potential. It can, for instance, play a role in its attraction to non-controlled predicates, as noted in De Smet (2007: 82):

“It appears that the presence of the definite article reduces the likelihood of a gerund construction receiving a controlled interpretation. The reason is that a piece of information, when marked as retrievable, typically does not require integration in the immediate context in order to be successfully interpreted, but is accessible to the hearer independently.”

The definite article, which marks a referent as identifiable and retrievable (see, amongst others, Hawkins 1978, Du Bois 1980, Declerck 1991, Langacker 1991, Lyons 1999), can be argued to influence the status of the nominal gerund on an existential level, as well. Even though there is no one-to-one relation between identifiability and existential presupposition, the presence of the definite article might facilitate the occurrence of nominal gerunds in contexts that imply existential presupposition while blocking it in others.

The referential profile of verbal gerunds, then, is argued to be driven by its *lack* of explicit determining elements. As the majority of verbal gerunds occur as bare forms without explicit subject, they “ground” their referents – i.e. locate them in time and space – in alternative ways (Fonteyn, Heyvaert & Maekelberghe 2015, Maekelberghe *forthc.*), by means of control relations for instance, as in example (82).

- (82) He remembered *practicing the same thing in the natatorium at the academy during seamanship training*.

Due to the indeterminacy of the verbal gerund form itself with regard to the accessibility and temporal status of its referent, verbal gerunds have come to rely on information that is available from the broader context, thus resulting in conceptual dependency. This is, amongst others, reflected in the types of predicates that they combine with, as described in De Smet’s (2013) work on complementation patterns: a verb like *think* for instance, does not combine with gerundive complementation because it “makes no predictions about the temporal and modal interpretation of the situation in its complement clause. Tellingly, complement-taking predicates of this kind usually require a finite complement” (De Smet 2013: 142). Verbs like *imagine*, on the other hand “impl[y] that the event is necessarily situated in a space of unreality, which reduces the need for modal and temporal grounding” and which thus makes it more compatible with a verbal gerund complement. This line of reasoning can be extended to noun complementation as well, where it could be observed that verbal gerunds tend to combine with nouns that display more conceptual overlap with the contents of their complement.

Finally, I showed that due to the abstract nature of their semantic profile, the meaning of nominal and verbal gerunds is actually more flexible and versatile than we might have expected. I therefore presented a more dynamic view on the gerund’s semantics, which takes into account its interaction with the lexemes it co-occurs with.

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Appendix

Head noun (NG)	freq >1	Head noun (VG)	freq >10	Predicate (NG)	freq >1	Predicate (VG)	freq >10
ban	7	way	417	require	36	consider	305
role	7	idea	275	allow	29	avoid	243
anniversary	6	process	243	involve	28	involve	221
effect	6	method	206	facilitate	26	try	195
evidence	6	approach	175	support	26	enjoy	144
result	6	chance	169	oversee	21	remember	144
story	6	importance	162	promote	15	recommend	135
concern	5	goal	147	encourage	14	love	125
criticism	5	cost	146	ban	13	suggest	120
question	5	hope	145	enable	13	imagine	118
approach	4	difficulty	127	improve	13	risk	110
call	4	interest	127	prevent	13	like	105
contribution	4	mean	124	see	13	require	87
issue	4	job	106	accelerate	12	propose	77
practice	4	strategy	105	follow	11	mind	76
skill	4	risk	103	announce	10	report	73
account	3	challenge	98	describe	10	support	55
challenge	3	effect	93	forbid	10	recall	48
need	3	possibility	92	prohibit	9	resist	46
occasion	3	purpose	92	address	8	help	37
problem	3	task	89	complete	8	favor	33
responsibility	3	practice	88	influence	8	oppose	29
site	3	benefit	80	order	8	deny	27
support	3	reason	76	justify	7	discuss	27
advice	2	year	66	protest	7	justify	27
aftermath	2	tool	64	witness	7	appreciate	26
alternative	2	habit	63	affect	6	fear	24
anger	2	success	63	celebrate	6	prefer	24
apology	2	act	62	criticize	6	entail	22
barrier	2	prospect	61	enhance	6	miss	20
belief	2	option	60	increase	6	regret	20
blame	2	responsibility	59	oppose	6	delay	19
book	2	experience	58	remember	6	describe	19
condition	2	dream	56	aid	5	advise	18
consequence	2	matter	56	avoid	5	hate	18
control	2	thought	56	condemn	5	contemplate	17
credit	2	problem	56	demand	5	advocate	16
decrease	2	step	55	discuss	5	envision	15
demand	2	intention	51	experience	5	admit	14
difference	2	framework	51	handle	5	prevent	14
distinction	2	advantage	49	ignore	5	emphasize	13
documentary	2	policy	47	permit	5	mention	13

emphasis	2	plan	46	recall	5	experience	11
end	2	system	45	supervise	5	forget	10
explanation	2	difference	41	cause	4		
film	2	model	40	chronicle	4		
framework	2	criteria	39	defend	4		
history	2	basis	39	ensure	4		
implication	2	history	38	halt	4		
importance	2	commitment	37	imagine	4		
increase	2	danger	37	investigate	4		
inquiry	2	potential	37	manage	4		
instruction	2	procedure	36	mark	4		
involvement	2	focus	36	observe	4		
method	2	guide	35	provide	4		
model	2	work	34	regulate	4		
moratorium	2	likelihood	33	represent	4		
opportunity	2	choice	31	signal	4		
outrage	2	technique	30	abandon	3		
preparation	2	attempt	29	advocate	3		
process	2	promise	29	assess	3		
reason	2	impact	29	authorize	3		
recommendation	2	value	29	control	3		
regulation	2	concern	29	coordinate	3		
response	2	barrier	28	delay	3		
retaliation	2	business	28	eliminate	3		
revenge	2	fear	28	fund	3		
step	2	probability	28	impact	3		
struggle	2	progress	28	inhibit	3		
study	2	result	28	limit	3		
time	2	skill	27	link	3		
value	2	question	27	mention	3		
		emphasis	27	organize	3		
		advice	27	outlaw	3		
		issue	26	precede	3		
		consequence	26	recommend	3		
		aim	26	reject	3		
		rule	26	restrict	3		
		implication	25	undertake	3		
		guideline	25	watch	3		
		credit	24	acknowledge	2		
		necessity	24	anticipate	2		
		notion	24	applaud	2		
		standard	24	appreciate	2		
		day	23	approach	2		
		suggestion	23	attempt	2		
		tradition	23	avenge	2		

	effort	22	confirm	2		
	delay	21	covering	2		
	pleasure	21	create	2		
	opportunity	21	demonstrate	2		
	wisdom	21	direct	2		
	concept	20	discourage	2		
	feasibility	20	drive	2		
	position	20	emphasize	2		
	trick	20	entail	2		
	vision	20	favor	2		
	art	19	govern	2		
	support	19	guide	2		
	argument	19	hasten	2		
	burden	19	hinder	2		
	attention	18	initiate	2		
	case	18	integrate	2		
	charge	18	like	2		
	example	18	minimize	2		
	joy	18	need	2		
	price	18	note	2		
	foundation	18	notice	2		
	resource	18	orchestrate	2		
	tip	18	outsource	2		
	rationale	17	plan	2		
	reputation	17	portray	2		
	aspect	15	practice	2		
	debate	15	preclude	2		
	information	15	prescribe	2		
	mechanism	15	produce	2		
	obstacle	15	propose	2		
	recommendation	15	question	2		
	service	15	recognize	2		
	decade	14	record	2		
	mission	14	reduce	2		
	mistake	14	report	2		
	record	14	review	2		
	reward	14	show	2		
	time	14	study	2		
	week	14	suggest	2		
	form	13	trigger	2		
	honor	13	trumpet	2		
	insistence	13	value	2		
	motivation	13	verify	2		
	principle	13				
	privilege	13				

		role	13				
		vehicle	13				
		alternative	12				
		discussion	12				
		justification	12				
		master	12				
		methodology	12				
		pain	12				
		solution	12				
		balance	11				
		protocol	11				
		requirement	11				
		talent	11				
		agreement	10				
		algorithm	10				
		ban	10				
		confidence	10				
		factor	10				
		measure	10				
		objective	10				
		power	10				
		secret	10				
		tactic	10				

Table (i): Raw frequency list of head nouns and verbs attested with nominal and verbal gerunds in the datasets.