

Aspectual and quantificational properties of deverbal conversion and -ing nouns

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1. Introduction

In this paper we explore the range of aspectual and quantificational readings that are available to two kinds of deverbal nominalizations in English, conversion nouns and *-ing* nominals. By quantificational readings, we mean the ways in which conversion and *-ing* nominalizations are construed as either count or mass (*a kick, too much kick, a kicking, too much kicking*). By aspectual interpretations we mean the ways in which we construe nominalizations as referring to on-going or unbounded events, as in (1), or as completed or bounded events, as in (2), among other distinctions that we will discuss in what follows:

(1) Swimming became a life-long habit for her.

(2) She enjoys a swim every morning.

Although this is not a subject that has received extensive treatment in the literature, observations and predictions concerning the aspectual and quantificational interpretations of various nominalizations have occasionally figured in philological literature (Biese 1941), the philosophical literature (Mourelatos 1978), in reference works (Grimshaw 2011, Bauer, et al. 2013), in the Cognitive Grammar literature (Park & Park 2017), and in the generative canon, including Grimshaw (1990), Brinton (1995, 1998), Alexiadou (2001), and Iordachioaia & Soare (2008), among others. To our knowledge, however, there has not been a thorough and comprehensive study of quantificational and aspectual readings of nominalizations in English, so it is worth assessing the descriptive and theoretical claims that have been made in passing and beginning to develop a coherent picture both of the facts and of their theoretical implications. This is what we set out to do here.

Our findings are based on a corpus study of 106 verbs which display both conversion and *-ing* nominalizations, many of them in both singular and plural. We study the range of readings available for the conversion and *-ing* forms of those verbs in context, looking at up to 300 tokens each of singular and plural conversion forms and singular and plural *-ing* nominalizations, a total of over 57,700 instances of nominalizations in context.¹ In section 2 we first review some of the literature in which questions of aspectual and quantificational interpretation of conversion and *-ing* nominalizations has figured; this will set the stage for the main research questions that we intend to tackle in what follows. In section 3, we set out the quantificational and aspectual categories we propose to look at and the terminology we use to designate them. Section 4 describes the methodology by which we extracted, cleaned, and coded data from the Corpus of Contemporary American English (henceforth COCA) and the British National Corpus (BNC).

¹ The reader may wonder why we did not also study the quantificational and aspectual interpretation of so-called ATK nominalizations (nominalizations like *-ation, -ment, -al*, etc., dubbed ATK by Borer (2013)). It would certainly have been a worthwhile effort, but the amount of data we proposed to examine was already very large, and we reluctantly decided to leave ATK nominals to a subsequent project.

We present our findings in sections 5 and 6. Section 5 looks at the quantificational properties of referential nominalizations. Section 6 looks at quantificational and aspectual properties of eventive nominalizations. Section 7 offers a brief assessment of the theoretical implications of our findings.

Our conclusion will be that the quantificational properties and aspectual interpretation of both conversion and *-ing* nominalizations are not rigidly or even loosely determined by the form of the nominalization, nor by the aspectual properties of the base verb. Of those two factors, the interpretation of the base verb plays a stronger role in quantificational and aspectual readings. But we will argue that an even stronger role is played by factors arising from the context in which conversion forms and *-ing* nominalizations are deployed. For example, we find that quantificational properties of conversion and *-ing* forms are not rigidly fixed, but rather are signalled in context, with many conversion and *-ing* nominalizations exhibiting both count and mass interpretations. We find as well that sometimes differences in quantification give rise in turn to differences in aspectual interpretation. The aspectual interpretation of conversion and *-ing* nominalizations can also be influenced by the presence of temporal and quantificational modifiers, by surrounding tenses, as well as by encyclopedic knowledge.

2. Theoretical background and claims in the literature

Although there has certainly been research in the past on the aspectual and quantificational interpretation of nominalizations in English and other languages, this has not been a particularly active area of research, nor one that has been explored in a particularly systematic way. Earlier literature that touches on the subject comments on relationships between eventive versus referential interpretation and count versus mass quantification, or between aktionsart and quantification, and occasionally on form of nominalization (different affixes, conversion) and aspect or quantification. To the extent that a coherent picture has emerged, it is that most researchers believe that conversion and *-ing* have different semantic properties, roughly that conversion has a perfectivizing or packaging function and tends towards count quantification and referential readings while *-ing* tends towards an imperfectivizing function, favoring mass quantification and eventive interpretations. In contrast, we will show in what follows that conversion and *-ing* are not distinguished in these ways, and that they behave quite similarly in terms of aspectual and quantificational readings. Indeed, what will emerge most clearly from our study is that conversion and *-ing* are both subject to substantial coercion in context that makes them amenable to a wide range of eventive and referential readings, mass and count quantification, and bounded and unbounded aspectual interpretations.

One of the first studies we can find of aspectual interpretation in English nominalization, specifically between conversion and *-ing* forms, is Biese (1941). Biese finds that there is “a very clearly marked difference in meaning between the two types of formation” (1941, 311), going on to say that:

This difference may be said to be brought out by the fact that *ing*-substantives mainly have a meaning denoting continuous action or existence, or expressing a habit or practice of doing something, while conversion-substantives denote acts of short or momentary duration, having a definite beginning and end.

And further (1941: 313) that, “The chief difference lies in the fact that the noun of action in its *-ing*-form expresses indefinite duration without reference to beginning or end, while the conversion substantives imply an action having a definite beginning or end.” Biese also notes in a footnote (1941, 311) that *-ing* nominals are associated with mass quantification and conversion nominalizations with count quantification.

Mourelatos (1978) remarks on a possible connection between the aktionsart of the base verb, the form of nominalization (*-ing* versus conversion), and the quantificational interpretation of the nominalization, suggesting that state and activity verbs yield mass-quantified nominalizations, whereas accomplishments and achievements yield count-quantified ones (see also Filip 2012, 736). Brinton (1995, 1998) considers in much more detail the way in which the aktionsart of the verbal base might affect the overall quantificational and aspectual interpretation of the nominalization (1995: 39):²

In English, both Latinate derivational suffixes and the native zero affix serve to perfectivize or package the aktionsart of the verb, much as the simple tense does in the verbal domain, with events presented as bounded wholes, activities treated as either indeterminately or determinately bound, and states remaining inherently unbound. The gerund serves to imperfectivize or grind the aktionsart of the verb, much as the progressive does in the verbal domain, resulting in unbounded situations. The mass or count quality of the deverbal noun depends, then, not just upon the aktionsart of the base verb, but also upon the aspect features of the deverbalizing device, the zero affix producing count nouns except in the case of states, the gerund always producing mass nouns,...

According to Brinton (1995), *-ing* has a preference for bases that denote activities. When *-ing* attaches to accomplishments or achievements it highlights the process leading up to the implied endpoint. Although the aktionsart of the base verb has some effect on bounded/unbounded readings for Brinton, she nevertheless maintains that there is a rough correlation between the means of nominalization (*-ing*, conversion, ATK affixes) and the aspectual and quantificational reading of the nominal.³ In a subsequent paper, Brinton (1998, 49) makes a stronger claim, namely that conversion “is a means of converting the situation into an event (an accomplishment, achievement, or semelfactive) by adding the feature of telicity; this is a shift from mass to count.” That is, conversion does not package an event, but rather supplies an implied endpoint or telos. Boundedness is in principle independent of telicity (1998: 59).

Aspectual and quantificational aspects of nominalizations have not been the subject of extensive attention within generative literature, but they do receive passing mention in several works. Grimshaw’s (1990) seminal work on argument structure and event nominalization is only tangentially of interest to us here. Although she does not touch in any depth on issues of

² Note that Brinton (1995) considers ATK nominalizations alongside conversion and *-ing* nominalizations.

³ Brinton does note (1995, 34) that the tense of the sentence in which a nominalization occurs can also affect its interpretation as completed or uncompleted, although it’s not entirely clear whether completedness is correlated with bounding in some way. We will return to observations about the effects of context on aspectual readings in section 6.2.2.

aspectual interpretation, Grimshaw does claim that *-ing* nominalizations are invariably complex events and that complex event nominalizations do not pluralize and cannot appear with an indefinite determiner (1990, 54-56). The latter is a hallmark, of course, of mass quantification, so we can infer that for Grimshaw, *-ing* nominalizations should be mass-quantified.

Working within a Distributed Morphology framework, Alexiadou (2001, 51) deals more directly with issues of aspect in nominalization. She briefly considers the relationship between form of nominalization and potential readings, observing that *-ing* nominalizations tend to be interpreted as imperfective and are less felicitous with accomplishments and achievements (telic events) than with activities. Borer (2013, 162) argues that eventive *-ing* is a functional element which produces atelic (in her terms ‘homogenous’) nominalizations. Iordachioaia & Soare (2008) are primarily concerned with nominalization patterns in Romanian, but their argument is nevertheless relevant here as they raise the possibility that particular types of nominalization might correlate with telicity. In Romanian, the infinitive selects for bounded events and does not change boundedness, whereas the supine takes any sort of base and gives rise to an unbounded interpretation. The infinitive behaves like a count noun, but the supine does not. Both Alexiadou (2001) and Iordachioaia & Soare (2008) present syntactic analyses of nominalizations in which the effects of aspect on nominalization are attributed to the presence of functional projections like AspP internal to the DP.

Further comments on the aspectual and quantificational characteristics of nominalizations can be found in several reference works. Grimshaw (2011, 1304) notes that *-ing* nominalizations can be telic, at least for change of state verbs and suggests further that state verbs lack *-ing* nominalizations entirely (2011, 1310). Bauer et al. (2013: 214) suggest that conversion nominalizations that express instantaneous aspect always have count quantification, and typically do not also allow non-count readings (*a chant/two burps*, but **some chant/some burp*). A non-count reading is frequently preferred for the corresponding *-ing* nominalization (*some chanting/some burping*).

Finally, within the tradition of Cognitive Grammar, Park & Park (2017) differ from much of the generative literature in that they recognize that conversion and *-ing* nominals can have both referential and eventive interpretations. However, their observations on aspect are in line with the other studies we have reviewed here. For them, deriving an *-ing* nominalization results in “the exclusion of the beginning and end of the verbal process, yielding an atemporal mass-like construal...” (2017, 725). In other words, *-ing* nominals are generally imperfective/unbounded and mass-quantified, although Park & Park do note that with the addition of an appropriate determiner (what they call ‘grounding’), count-quantification is made possible (2017, 727).

What emerges from this brief review of the literature is the suspicion that there is more to be said on this subject: although we might expect that there is some relationship between the means of nominalization (conversion vs. *-ing*), the quantificational characteristics (count vs. mass) of the noun, the aktionsarts of the base, and the aspectual reading of the nominalization (bounded, unbounded, telic, atelic, etc.), we have yet to untangle this complex web of potential relationships. What has been lacking in the literature is a thorough and systematic descriptive study of the expression of aspect and quantity in various types of nominals looking at a wide range of nominalizations as they occur in context. What we will try to show in what follows is

that the picture that emerges from a careful corpus analysis is both simpler and more complex than the sporadic studies reviewed above have suggested. It is simpler in that conversion and *-ing* turn out not to be so different in their aspectual and quantificational properties after all. It is far more complex, however, in that the ultimate readings of conversion and *-ing* nominalizations appear to result from a complex interplay of the semantics of their bases and coercion by a wide range of contextual factors.

3. *Matters of definition*

We must start then by trying to make clear what we will mean by the terms that we will use in our analysis. We begin with straightforward and standardly used terms like ‘count’ versus ‘mass’ and ‘referential’ versus ‘eventive’. We then move to relatively well understood (but nevertheless sometimes still controversial) terms for aktionsarts (state, activity, accomplishment, achievement, semelfactive) and their relationship to concepts like durativity, telicity, and boundedness. We end, finally, with establishing what we mean by ‘aspect’ in nouns, where there has been far less clear discussion and in particular what we mean by ‘bounded’ and ‘unbounded’ when we refer to the readings of nominalizations.

Count nouns are nouns that can occur with the indefinite determiner and with numerals and quantifiers such as *many*. Mass nouns resist indefinite determiners, do not occur in the plural, and prefer quantifiers such as *much* or *some* (Huddleston & Pullum 2002, section 3.1). It is also uncontroversial that although nouns like *squirrel* and *water* are typically conceptualized as count and mass respectively, count nouns can almost always be coerced into mass readings and mass nouns into count readings:

- (3) a. There was some squirrel in the Brunswick stew.
 b. Please pick up three waters and a coffee.

We will assume that simplex nouns often have a default quantification: *squirrel* is default count and *water* default mass, but can be coerced into the non-default quantification given the right context.

It has also been widely noted that nominalizations may have two different kinds of readings. One is the reading that is variously referred to as the ‘result,’ ‘referential,’ or ‘R’ reading. With this reading, the nominalization denotes the outcome or product of the event or a participant in the event (agent, patient, instrument, location, etc.). The ‘eventive’ or ‘E’ reading, in contrast, denotes the event (or state) itself. The two readings are illustrated in (4):⁴

- (4) a. The examination was ten pages long. (referential)
 b. The examination of the patient took over an hour. (eventive)

⁴ Grimshaw (1990) additionally distinguishes what she calls the Complex Event reading, which occurs when a deverbal nominalization occurs with all its arguments, from a Simple Event reading, which is an eventive reading when the nominalization lacks one or more of its arguments. We will not make this distinction here. See Lieber (2016) for a discussion of this distinction.

We now turn to distinctions that pertain to the semantics of the verbal bases on which nominalizations are derived. Since we will be discussing deverbal nominalizations of a wide range of verbs, we begin with the assumption that just as nouns may have a default quantification, verbs may have a default lexical aspect, in other words the lexical semantic contribution of the verb to phrasal or sentential aspect. Filip (2012, 721) defines lexical aspect as “a semantic category that concerns properties of eventualities (in the sense of Bach, 1981) expressed by verbs.” These characteristics are ones that contribute to (but do not entirely determine) what Filip calls aspectual classes or aktionsarts, following the work of Vendler (1957) and many others.

The literature on aktionsarts typically distinguishes four or sometimes five different kinds of situations (where ‘situation’ is a term that covers events and states)⁵, typically states, activities, accomplishments, achievements, and semelfactives.⁶ Our understanding of aktionsarts largely follows that of such theorists as Smith (1991), Brinton (1995, 1998) and Filip (2012) in considering each aktionsart as a composite of more primitive conceptual categories.

- States are distinguished from events (activities, accomplishments, achievements, semelfactives) by requiring no input of energy to persist (Comrie 1976, 49). They do not imply change or transition and they involve no endpoint, either temporal or intrinsic. Events all involve some input of energy.
- Activities are events that do not involve transition or change. They are durative rather than punctual, and they do not imply an intrinsic endpoint.
- Accomplishments involve some transition or change, and like activities are temporally durative. Unlike activities, they imply an intrinsic endpoint.
- Achievements also involve transition or change and imply an intrinsic endpoint, but they are temporally punctual.
- Semelfactives are punctual, like achievements, but do not imply a transition or change, nor do they imply an intrinsic endpoint.

(5) gives the lexical categorization of some verbs:

- (5) a. *states*: love, fear, know
- b. *activities*: dance, push, float
- c. *accomplishments*: cook, wash, cover
- d. *achievements*: arrive, explode, find
- e. *semelfactives*: flash, blink, cough

⁵ Another term used as a cover for states and events is ‘eventuality’.

⁶ Vendler (1957) recognizes only four classes, states, activities, accomplishments, achievements. Smith (1991) adds the fifth class, semelfactives, to account for verbs that are punctual, like achievements, but do not have any implied endpoint.

We must be clear that these are *default* classifications of the lexical aspect of verbs. It is well known that various features of context – presence or absence of temporal modifiers, prepositional phrases, the quantification of objects or subjects – can change the aspectual interpretation of the verb (or verb phrase, or sentence). For example, although the default lexical aspect of *push* is an activity, with the addition of a PP expressing a goal, a sentence in which it occurs can be construed as an accomplishment, as in (6) (Verkuyl 1972):

(6) We pushed the car into the garage.

We will assume that the lexical semantics of verbs may contribute facets of meaning that contribute to aktionsarts and will distinguish in what follows between lexical aktionsarts and contextually induced aktionsarts.⁷

We now turn to the rather vexed notion of ‘boundedness’. Several works in the literature on nominalization and aspect make use of the terms ‘bound(ed)’ and ‘unbound(ed)’. The literature suggests that some insight is to be gained by applying the term cross-categorially to both nouns and verbs. Looking first at the nominal domain, count nouns are often described as being intrinsically bounded and mass nouns as unbounded (Talmy 1988, Jackendoff 1991, Brinton 1995, among others). When a mass noun is coerced to a count noun, the process is sometimes known in the literature as bounding, or alternatively ‘packaging’ (Jackendoff 1991, Brinton 1995). Talmy (1988, 179) uses the term ‘portion-excerpting’. Coercion in the opposite direction – from count to mass – is sometimes known as ‘debounding’ or more frequently as ‘grinding’.

The terms bounded and unbounded are also used in the verbal domain, with boundedness sometimes equated with perfectivity or completed events and unboundedness with events that lack an arbitrary temporal endpoint, for example, progressives or continuative events (Brinton 1995, 32, citing Paprotte 1988, 459 Jackendoff 1991, 19). But elsewhere the term ‘bounded’ has been used in the verbal domain as equivalent to telic (Declerck 1979, Smith 1991, 26, Jackendoff 1991, 20). In other words, boundedness and telicity are sometimes linked and even entirely conflated.

We believe that equating or conflating telicity and boundedness is a mistake. Here we follow Depraetere (1995), who points out that telic events are not inevitably temporally bounded, and suggests that, “A sentence is bounded if it represents a situation as having reached a temporal boundary, irrespective of whether the situation has an intended or inherent endpoint or not. It is unbounded if it does not represent a situation as having reached a temporal boundary” (1995, 3). Depraetere offers the examples in (7) to show that an atelic predicate can be bounded if an arbitrary temporal endpoint is designated, as in (7a), or a telic predicate can be unbounded if an endpoint is implied, but not reached), as in (7b):

(7) a. Judith played in the garden for an hour.

⁷ Smith (1991), Brinton (1998), and Filip (2012) all develop systems that break down the five aktionsarts according to binary features. Such feature systems are potentially useful in modeling how the quantificational and aspectual readings of deverbal nominalizations are computed, but as we will not attempt such modeling here, we will not look further into such feature systems.

- b. John was opening the parcel.

The important point for our purposes is that an intrinsic endpoint and a temporal endpoint may coincide, but a lexically implied intrinsic endpoint does not inevitably necessitate an actual temporal endpoint. Endpoints may be implied, even if they are not reached.

We now come to the thorniest point in our consideration of terminology, how the terms ‘bounded’ and ‘unbounded’ should be deployed in discussing the aspectual characteristics of deverbal nominalizations. If we concentrate only on the status of a noun as count versus mass, deverbal nominalizations might simply be considered bounded when they show count-quantification and unbounded when they show mass-quantification. On the other hand, because they have verbal bases, we might expect that nominalizations might also imply the presence or absence of temporal endpoints, that is, bounding in the verbal sense. And of course the lexical aspect of their verbal bases might contribute an implied intrinsic endpoint, complicating matters still further. How do we tease apart nominal boundedness from verbal boundedness, temporal endpoints from intrinsic endpoints, and so on? To our knowledge, none of the literature we have cited in section 2 has taken on this terminological and conceptual tangle.

Theoretically we might have no problem here, if it were the case that bounding in the nominal domain always correlated with bounding in the verbal domain, with count nominalizations always expressing temporal boundedness and mass nominalizations always expressing temporal unboundedness. But this is not what we find. Consider the examples in (8). All contain eventive *-ing* nominalizations based on verbs that are accomplishments or achievements:

- (8) a. *American Artist 1999*: "My backgrounds often consist of reds, blues, and yellows, so too much BLENDING can create a muddy appearance," the artist concedes.
(mass/temporally unbounded)
- b. *American Artist 1991*: He managed this through a carefully muted gradation of tones and a BLENDING of outline edges, accomplished through dry-brush work.
(count/temporally bounded)
- c. *American Artist 2006*: With oils a further BLENDING can be accomplished with a soft sable brush; with pastels a stump, a flesh-colored pastel pencil, or your finger can be used. (count/temporally unbounded)
- d. *Science News 2006*: The smooth patches indicate that the south-polar area has undergone recent FRACTURING or upheavals. (mass/temporally bounded)

In (8a), we observe mass quantification (*too much blending*). In terms of temporal construal, we understand *blending* to refer to an event the temporal bounds of which are not implied or not important, in other words unbounded in the verbal sense. Although the verbal base of the *-ing* form is telic, both the quantification and the temporal aspect match in terms of being unbounded, which is what we would expect if bounding in the nominal domain and bounding in the verbal domain were linked. In (8b), we again have a match between bounding in the nominal domain (the *-ing* form is count) and bounding in the verbal domain (the event is completed), again as we would expect if bounding in the nominal domain and bounding in the verbal domain were linked.

But such linking seems not to be inevitable, as (8c) and (8d) suggest. In (8c), the quantification is count (bounded in the nominal domain), but no temporal endpoint is implied, so the aspectual interpretation is unbounded and does not match the quantification. Finally, in (8d) we again have a mismatch: in the nominal domain we have mass quantification (= unbounded), but in the verbal domain we have clear temporal boundaries

What such examples point to, for us, is the conclusion that analogies that have been drawn between bounding in the nominal domain and bounding in the verbal domain run into difficulties precisely in the case of deverbal nominalizations. Since our goal in what follows is to understand the factors that contribute to the quantificational and aspectual construal of nominalizations rather than to develop a theory of links between quantification and aspect per se, we will settle here for using a set of descriptive terms for various readings: count versus mass, which we will use in the conventional sense, and bounded versus unbounded, by which we mean having or lacking linguistically relevant temporal boundaries. We will return in section 6 to the question of what we mean by boundedness in nominalizations and whether temporal bounding in the construal of nominalizations is actually a unitary concept. We will argue that there are actually two kinds of bounded readings: a package reading that emphasizes both the presence of left and right boundaries (beginning and end) of the event and a completive reading that focuses more on the right boundary (the endpoint) of the event.

4. Methodology

Our dataset comprises a total of over 57,700 instances of nominalizations in context, which were extracted from the Corpus of Contemporary American English and the British National Corpus. Most of the nominalizations appear in both singular and plural (e.g. *blend*, *blends*, *blending*, *blendings*). The conversion forms and *-ing* nominalizations in our dataset are based on 106 verbs which are given in Table 1. We chose 98 verbs from the 1000 most frequent verbs listed in the COCA frequency list that exhibited verb-to-noun conversion and *-ing* nominalizations; equal numbers of verbs were chosen from all frequency ranges. These were supplemented with 8 low frequency verbs which are not represented in the COCA frequency list. We then checked the OED to make sure that in each conversion pair, the verb was attested earlier than the noun rather than the other way around.

Second, we extracted up to 300 tokens each of singular and plural conversion forms and singular and plural *-ing* nominalizations from COCA. Where there were fewer than 300 tokens in COCA, we supplemented with tokens from BNC (up to 300). We chose the number 300 for two reasons: on the one hand it is large enough to uncover a range of quantificational and aspectual readings for each verb, and on the other hand small enough to be relatively manageable.

Third, we applied standard cleaning procedures and eliminated examples that were proper nouns, typos or misspellings, or words in a foreign language. We also eliminated examples that exhibited such a high degree of lexicalization that the nominalization was rendered not useful for our study (e.g. *grand slam*, ‘a set of major championships or matches in a particular sport in the same year, particularly in tennis, golf, or rugby union’).

We coded our data as follows. First, we classified our 106 verbs according to the standard aktionsarts (Vendler 1957, Smith 1991, Filip 2011): states, activities, accomplishments, achievements, and semelfactives. Twenty-one of our verbal bases belonged to more than one class, usually because they exhibit multiple senses (for example, *cast* as used in fishing or in sculpting). We also classified our conversion forms and *-ing* nominalizations into those with a referential reading and those with an eventive reading. For those nominalizations with eventive readings, we also coded for boundedness. Instances with bounded readings were also coded for completive reading or package reading. Finally, we coded our data with respect to the mass/count distinction. For example, *hires* in (9a) is referential and count, whereas *hires* in (9b) is eventive, bounded/package and count.

(9) referential versus eventive

- a. *Atlanta Journal Constitution 2012*: Two recent HIREs are introduced. One presents a slide show about a fortune-cookie-making machine he designed, cracking wise throughout. Another acts out a comedy sketch about a fictional crazed caller (Referential, Thematic Role: theme, Quantification: count)
- b. *Associated Press 2012*: The Washington Post this past week compiled a list of military contractors, hospitals and universities that are delaying HIREs and bracing for cuts (Eventive, Boundedness: bounded/package, Quantification: count)

In (9a) *hires* designates the people hired, rather than the act of hiring. (9b), on the other hand, focuses on instances of the act of hiring, that is, our ‘bounded-package’ reading. Both examples have the conversion nominalization in the plural, and are therefore count-quantified.⁸

Table 1 give a summary of our verbs by aktionsarts.

Table 1. Verbs by class

Class	Verbs
State	concern, desire, doubt, fear, hate, hope, lack, love, stink, worry
Activity	account, assist, chat, climb, cough, dance, design, drink, drive, embrace, float, gurgle, hold, hurt, kiss, leak, play, push, rest, ride, run, sail, spin, stay, step, stir, stretch, stumble, swim, wait
Accomplishment	bend, blend, burn, change, cover, display, fall, fix, form, heat, melt, mix, repair, report, rise, spread, strip, surround, take, transfer, wash
Achievement	break, burst, catch, chop, find, finish, fracture, kill, reach, reveal, slam, split, win

⁸ Coding was based on the judgments of the two authors. The examples we cite in what follows are ones where the authors agree that the reading in question is attested. Ideally in a study of this sort, one might wish for a larger number of coders as well as a check of inter-rater reliability. However, since our aim was to establish the possibility of a range of readings for conversion and *-ing* nominalizations rather than to quantify how often they occur, we did not aim for this stricter standard.

Semelfactive		blink, drip, flash, hit, jump, kick, knock, poke, punch, spring, tap
Mixed or unclear	Accomplishment or achievement	bet, cast, cut, divide, draw, exit, grant, hire, offer, order, pay, return, shift
	Activity or semelfactive	beat, shake, shove
	Activity or achievement	pass
	Semelfactive or achievement	pop, strike
	Activity or state	taste

5. Findings: referential interpretations

5.1 Referentiality

Both conversion forms and *-ing(s)* nominalizations can have referential readings. In particular, conversion forms lend themselves readily to referential interpretations. Only eight conversion forms derived from the 106 verbs in our dataset did not exhibit referential readings, either in the singular or plural: *blink*, *embrace*, *flash*, *kiss*, *lack*, *shove*, *stir*, and *swim*. Although *-ing* nominalizations tend to prefer eventive interpretations, in our data at least 33 of our verbs have *-ing* nominalizations with clear referential readings in either the singular, the plural, or both (10):

(10) *-ing* forms with referential readings: *accountings*, *assisting*, *bending*, *blending(s)*, *casting(s)*, *catching*, *climbing*, *covering(s)*, *cutting(s)*, *dancing(s)*, *dividing*, *drawing(s)*, *drippings*, *finding(s)*, *finishing(s)*, *fixings*, *heating*, *holding(s)*, *kicking*, *meltings*, *mixings*, *offering(s)*, *returning*, *rising(s)*, *sailing*, *spinning(s)*, *stepping*, *surrounding(s)*, *takings*, *tastings*, *washing(s)*, *winnings*, *worryings*

(11) gives examples of conversion forms with referential readings, and (12) presents referential *-ing* nominalizations.

(11) referential conversion nominalizations by aktionsart

a. *State* hope ‘the thing that one doubts hopes’

Atlantic Monthly 1999: The history of African-Americans since the discovery of the New World is the story of their encounter with technology, an encounter that has proved perhaps irremediably devastating to their HOPES, dreams, and possibilities.

b. *Activity* climb ‘the place one climbs’

Backpacker 1994: We do this all the way to the base of the CLIMB. This process, the verbal evaluation of potential pitfalls and the subsequent analysis of appropriate responses, is standard operating procedure for mountaineers.

c. *Accomplishment* display ‘the stuff that’s displayed’

Astronomy 1998: My favorite DISPLAY, though, was a collection of Lowell's original sketches of Mars.

d. *Achievement* find 'the thing one has found'

Astronomy 2006: True to Haag's nature, he outdid even these collecting accomplishments. His greatest FIND was not made in the field but given to him wrapped in a brown card-board box.

e. *Semelfactive* drip 'a small drip-like quantity'

Ploughshares 2005: "That's just wrong," Bob said, stepping away and sipping a sad little DRIP of tequila.

(12) referential *-ing* nominalizations by aktionsart

a. *Activity* account 'a document about accounts'

The Antioch Review 2001: You never saw statements concerning your inheritance, did you? Never received annual ACCOUNTINGS?

b. *Accomplishment* bend 'the place that has a bend'

Technology Review 2002: This prototype has flexible, hinged blades; in strong winds, they bend back slightly while spinning. The BENDING is barely perceptible to a casual observer, but it's a radical departure from how existing wind turbines work-and it just may change the fate of wind power.

c. *Achievement* find 'thing one has found'

Journal of Visual Impairment & Blindness 2006: A second interesting FINDING is the apparent confusion over the causes of these infectious diseases and the struggle within the medical community to find treatments for them.

d. *Semelfactive* drip 'substance that has dripped'

Science News 2006: At the older camp, the group found that manganese, phosphorus, and strontium concentrations in soil were an order of magnitude higher under the drying racks than in soils outside the camp. DRIPPINGS from the fish probably caused the difference.

The examples in (11) and (12) show clearly that there is no strict correlation between type of nominalization (i.e. conversion, *-ing*) and type of reading (referential or eventive). It follows from the absence of such a correlation that we should expect to find doublets where the

conversion form and the corresponding *-ing* form might have precisely the same meaning. And we do indeed find such doublets, as the examples in (13) illustrate:⁹

(13) Minimal pairs of conversion and *-ing* nominals with referential readings

a. cut/cuttings

San Francisco Chronicle 1992: Thirteen of the train's estimated 100 passengers suffered minor injuries, including CUTS, bruises and back strain.

Ebony 2000: in the Bible's book of Leviticus 19:28, God tells Moses: "Ye shall not make any CUTTINGS in your flesh for the dead, nor print any marks upon you."

b. finish/finishing

USAToday 2015: The Ared 5000 stretch fabric is waterproof (absolutely guaranteed to keep the wet out) and water repellent (the fabric FINISH is such that it won't retain moisture and water simply rolls off the jacket);

Forbes 1990: Final FINISHING on the gun is called "French grey."

c. melt/melting

Chicago Sun-Times 2006: Three to a serving (about the size of a golf ball), the arancini sported a mellow MELT of mozzarella under a crusty golden shell.

The Kenyon Review 2006: She snapped off her glasses and drained the MELTINGS of her Bloody Mary and placed the cup back in its bezel.

5.2 Referentiality and quantification

One interesting finding that emerges clearly from our study is that it is especially common for *-ing* forms to be interpreted referentially when they occur in the plural, and in fact, several forms (*surroundings*, *coverings*, *drippings*, *holdings*, *winnings*, and *mixings*) are always referential in our data. In some cases, the referential *-ing* forms show the same meaning in both the singular and the plural forms, as the examples in (14) show:

(14)

a. covering/coverings

Military History 2005: bend the weapon into its final shape, adjusting it as necessary to make sure the limbs of the bow would draw evenly. Finally he would add a waterproof COVERING of thin leather, bark or snakeskin. The composite bow was mechanically superior to wooden bows, as the horn and sinew made it capable of standing greater compression

Saturday Evening Post 1993: You want bulbs without deep scars, but small nicks and loose paperlike COVERINGS (tunics) are acceptable.

⁹ We found similar doublets for *take/taking* and *wash/washing*. Note that examples like those in (15) present a challenge to the principle of blocking.

b. casting/castings

Inc. 1995: We used to fall behind schedule because our planning failed to account for the resting time a CASTING requires between steps. By starting our calendar on Friday, we visually incorporate Saturday's and Sunday's downtime-- indicated by the shaded areas-- and stretch production

Black Enterprise 1990: Renaming the 7-year-old company Wesley Industries, Mullens has fit the foundry snugly with his two other Michigan plants. While the Flint, Mich., operations continue to produce painted and metal parts for the Big Three auto manufacturers, the New Haven plant will manufacture cylinder heads, exhaust manifolds and grey iron CASTINGS for Chrysler Corp. and General Motors' Diesel-Allison Division.

In (14a), for instance, *coverings* is the plural form of *covering* with the meaning “a layer that covers something”. In a similar vein, *cutting* in (15a) and *cuttings* in (15b) have the same meaning, i.e. something that has been cut off (e.g. a part of a plant). In (15c), however, the plural *cuttings* appears with the reading “an injury made when the skin is cut with something sharp”. This reading is similar to the conversion form *cuts* and does not appear with the singular *cutting*.

(15) cutting/cuttings

a. *Horticulture 1992*: Firm the moss around the CUTTING to protect it until it roots. After your base is established, you can have some fun with design. Colbert likes to start by choosing three accent specimens

b. *Harpers Magazine 1993*: His wife walked in from outside, carrying some CUTTINGS. She poured water in a glass vase and stood at the counter, arranging the flowers, her back to him.

c. *Ebony 2000*: "Ye shall not make any CUTTINGS in your flesh for the dead, nor print any marks upon you."

We also find, however, that there are plural *-ing* forms that are quite distinct in meaning from the corresponding singular *-ing* forms. Consider the examples in (16):

(16) *Sunset 2009*: Meanwhile, make gravy: Pour DRIPPINGS into a clear measuring cup, using a fat spatula to scrape off browned bits stuck to pan.

Backpacker 2004: Assemble a Dagwood-style tortilla wrap with FIXINGS like cheese, salami, hummus, and fresh bell peppers.

The Kenyon Review 2006: She snapped off her glasses and drained the MELTINGS of her Bloody Mary and placed the cup back in its bezel.

The Virginia Quarterly Review 2005: I kettled water and thrashed about for some MIXINGS.

Associated Press 2002: They'd rob a few people, have a few laughs, spend their TAKINGS on booze and drugs.

Forbes 2003: Thanks to boom-time WINNINGS, they have the money to seed a new crop of startups, helping Silicon Valley-- which might better be dubbed "the Bust Belt"

The examples in (16) suggest that not all plural *-ing* nominalizations are based on the singular *-ing* form. That is, there is no singular *dripping* that corresponds to the sense of *drippings* in (16), nor are there examples of *taking* or *winning* with the meaning 'things/stuff which are won or taken'. Similarly for *fixings* and *meltings*, both of which lack singular counterparts with the same referential meaning. What this suggests to us is that *-ings* might be in the process of becoming a nominalizing affix in its own right with a collective flavor: examples like *winnings*, *takings*, *meltings*, and *drippings* always have a collective reading and denote the internal object of the verb.¹⁰

We now turn to the question of whether referential conversion and referential *-ing* nominalizations show any correlations in terms of count or mass-quantification. Our data show clearly that no such correlations exist. Thus, it is not necessarily the case that there is a correlation between referential *-ing* nominalizations and mass interpretation, on the one hand, and referential conversion nouns and count interpretation on the other hand (cf. Brinton 1995). This of course does not mean that any *-ing* nominalization or conversion form can receive either a count or a mass interpretation. For example, in our data *beat* is always count and *hurt* is always mass-quantified. In more detail, conversion nouns often receive mass interpretations: 50 of 106 verbs are found with mass quantification. The vast majority of *-ing* nominals (90 of 106) can receive count interpretations. Twelve of those 90 *-ing* nominals only occur with count interpretations (*accounting*, *beating*, *bursting*, *covering*, *displaying*, *embracing*, *finding*, *offering*, *revealing*, *staying*, *surrounding*, *transferring*). Examples of conversion forms and *-ing* nominalizations with count and mass interpretations are given in (17):

(17)

a. *Activity*

Conversion count

Backpacker 1996: MiniWorks fared well with its plastic lever pump that's easy and comfortable to hold. The intake hose is long, which makes it versatile, and an adjustable FLOAT keeps the intake from resting on the mucky bottom of a creek or river. The active ingredient in this filter is a ceramic filter cartridge with a carbon core

Conversion mass

Skiing 1995: pole plants-- a very good idea for two reasons: Exaggerating the upward motion of a pole plant helps to unweight the skis and allows for a bit of FLOAT in the end of the turn (an old powder ploy), and keeping your hands up will also help protect your face from unfriendly branches or angry squirrels

¹⁰ In this sense, the suffix *-ings* might be following the same trajectory that Lieber (2016: 85) suggests for the suffix *-ables*, namely that it is in the process of becoming an independent collective inanimate-patient referencing suffix. Considerations of space prevent us from pursuing this suggestion further.

-ing count

The World & I 1998: The woman herself was slim. Her hair had tinges of a lighter rust color, little SPINNINGS of paint along her neck.

-ing-mass

Mother Jones 2010: While stallions sent to long-term HOLDING are gelded, their wild brethren continue to reproduce.

b. *Achievement*

Conversion count

NYTimes 2015: Gate to the Forbidden City for being the only foreigner to compete -- notwithstanding a FINISH that placed me somewhere around 1,120th, an hour or more behind the winners.

Conversion-mass

Mother Jones 1997: stood my mother with four German tourists, large and blond and gleaming in their sweat-streaked khakis, expensive cameras and voluptuous leather travel bags draped around them like fresh KILL.

-ing count

Magazine Antiques 1998: La Farge too was selected without the niceties of a competition, but he was also an obvious choice for the project. His decorative FINISHINGS had been incorporated into McKim, Mead and White buildings routinely for the past decade.

-ing mass

Technology Teacher 2009: socket, liner (interface between the skin and the socket), knee (in prostheses for tight amputation), adapters, feet, and cosmetic FINISHING (Reykjavik, 2005).

c. *Semelfactive*

Conversion count

Fantasy & Science Fiction 2010: Harris had you by eleven seconds. If you'd kept close, you would have toasted him at the end. The kid thinks he has a KICK, but he doesn't.

Conversion mass

Prevention 2000: There are other less-common causes, however. Dieting can contribute to bad breath, as can postnasal DRIP.

-ing count

Mother Earth News 2011: In a large skillet over medium heat, heat an additional quarter cup of bacon DRIPPINGS or vegetable oil, then add the drained beans, a couple of spoonfuls at a time. Mash each addition of beans with a wooden spoon or, my

-ing mass

Physical Educator 1996: With the softball example, locomotor skills such as skipping and hopping and manipulative skills such as punting and KICKING do not have to be taught since these skills are not related to the goal of playing softball. Thus, more time can be spent on learning and mastering

d. *Accomplishment*

Conversion count

Atlantic Monthly 1998: Intellectual property is knowledge or expression that is owned by someone. It has three customary domains: copyright, patent, and trademark (a fourth FORM, trade secrets, is sometimes included).

Conversion mass

Mens Health 1995: Be specific about fabric. This doesn't mean you have to know the percentage of wool or silk in a BLEND. Common knowledge and common sense will do for openers.

-ing count

The ravening 2008: So this was the foreign scent he'd smelled- her scent. It filled his flared nostrils still. He recognized it now-herbal and clean, a BLENDING of rosemary and lavender-all manner of herbs-a fragrance of the wild-of the wood-of the earth, mysterious and evocative.

-ing mass

American Artist 1992: As far as warping or BENDING goes, Masonite typically curves, especially in the larger sizes. Painting an equal thickness of primer on both sides will help.

e. *Stative*

Conversion count

Arts Education Policy Review 1997: I have no DOUBTS, therefore, that the aesthetic education program produced by LCI over the years must have a beneficial effect on the students who are exposed to it.

Conversion mass

Backpacker 1995: Though bothersome, swelling alone is nothing to worry about. There is some CONCERN, however, about women on birth control pills and altitude.

-ing count

Review of Contemporary Fiction 2009: And as for small difficulties and WORRYINGS, prospects of sudden disaster, peril of life and limb; all these, and death itself, seem to him only sly, good-natured hits, and jolly punches in the side bestowed by the unseen and unaccountable old joker.

Referential readings are rather rare for stative verbs, and we found no clear examples of referential *-ing* nominalizations with mass quantification.

6. Findings: eventive interpretations

Just as we find referential interpretations with both conversion and *-ing* nominalizations, we find eventive interpretations with both means of nominalization. The *-ing* nominalizations not surprisingly are more consistently eventive, although as we saw in section 5, referential readings are also relatively common. What might be seen as more surprising is that conversion nouns are frequently eventive in interpretation. Of our 106 verbs, we find only a handful that never seem to express eventive readings, either in the singular or plural, namely, *cover*, *form*, *heat*, *mix*, and *stink*. Some conversion nouns express eventivity only in the singular; for example, psych-states like *doubt*, *fear*, *hate*, *hope*, *worry* tend to work this way. We illustrate with a representative selection of verbs:

(18) eventive conversion nominalizations by aktionsart

a. State (hate)

Newsweek 1991: What he got instead was HATE, based simply on the color of his skin.

b. Activity (float)

Field and Stream 2007: A good three-day, two-night FLOAT with camping, plenty of smallies, and a few whitewater challenges runs about 35 miles from a speck on the map called Twickenham to another tiny spot called Clarno.

c. Accomplishment (repair)

Science News 1993: Each walk is supposed to last six hours, but the teams may stay out an hour or two longer if they find themselves in the middle of a critical REPAIR, Hoffman notes.

d. Achievement (kill)

Esquire 2003: He's calm, almost stoic in the KILL.

e. Semelfactive (knock)

Child Life 1999: Just then there was a KNOCK at the door, and a voice in the darkness called, "Open in the name of His Excellency, George Washington!"

(19) eventive *-ing* nominalizations by aktionsart

a. State (hate)

Newsweek 1991: His HATING began early in life.

b. *Activity* (float)

Understanding Children 1992: (BNC): Further evidence of young children's tendency to psychologize comes from a series of studies in which Piaget (1929,1930) interviewed children about the causes of various phenomena, such as dreams, the origin of the sun and the moon, the weather, the nature of air, the movement of the clouds, the FLOATING of boats, and the workings of a steam-engine.

c. *Accomplishment* (repair)

American Spectator 2006: Religion will be effectively expelled from one of the areas where it is most needed, which is the REPAIRING of damaged human relations.

d. *Achievement* (kill)

Mother Jones 2005: Pollard soon discovered that he had either been out of the state or in jail at the time of the KILLING, and found a taped statement from one of the witnesses confessing that she had made up her story.

e. *Semelfactive* (knock)

Harpers Magazine 1999: A loud KNOCKING on the door interrupts Grandioso's elegiac monologue.

It is clear, then, that there is no consistent correlation of conversion with referentiality and *-ing* nominalization with eventivity.

6.1 Eventivity and quantification

We have also failed to find any consistent correlation between quantification and type of eventive nominalization (that is, conversion versus *-ing*). As we saw in section 2, there have been sporadic claims in the literature that conversion nouns tend to be count-quantified and *-ing* nominalizations mass-quantified (Mourelatos 1978, Brinton 1995).¹¹ Although there may be a weak tendency in this direction in the sense that some conversion nominals only occasionally yield mass readings and some *-ing* nominals only occasionally yield count readings, it nevertheless seems more the norm than the exception for conversion nominalizations and *-ing* nominalizations to be found with either count quantification or mass quantification. Indeed, of the 106 verbs that we examined, there are only 10 whose singular conversion and *-ing* nominalizations consistently exhibit the correlation claimed in the literature (count ~ conversion//mass ~ *-ing* nominalization): *chop, dance, drink, fix, hit, pass, poke, run, slam, and swim*. This number drops to four if we look as well at plural nominalizations (*chop, dance, drink and swim*), as the ability to occur in the plural automatically signals count-quantification. Again, we provide some representative examples, arranged by lexical aktionsart:

¹¹ Note that those studies do not study quantification in relation to eventive or referential reading, so we presume that the claim is that regardless of reading conversion nouns should be count-quantified and *-ing* nominalizations mass-quantified.

(20) a. *state*: hate

conversion count

Smithsonian 1992: He trusts no one but himself; never concedes -no matter how far behind he may be and hates his opponents with an all-enduring HATE.

conversion mass

Bicycling 2003: They 're ruthless, full of HATE, and they'll do anything they can to keep us off the mountain.

-ing count

BNC Fiction 1991: A sudden hatred came over her; a cold, bitter HATING of everything that lived and breathed.

-ing mass

Showbiz Tonight 2011: Now, Wendy, this isnt goofing around hating. This is real HATING. Where is it coming from?

b. *activity*: push

conversion count

Atlantic Monthly 1993: For it to do so required a plan, a PUSH, an exercise of central power.

conversion mass

Sporting News 2006: Though Cofield hasn't generated a lot of PUSH, his play has gotten increasingly stronger on the line and he isn't often moved backward.

-ing count

Essence 1993: There were no fists, no slaps, just a continual PUSHING, he of her, against the wall as if to pin her there and capture or extinguish the source of her resistance, and her continued pushing against him...

-ing mass

Analog Science Fiction & Fact 2010: There's been some PUSHING of our limits, but nothing serious.

c. *accomplishment*: change

conversion count

Health & Social Work 2006: A significant CHANGE in the new regulations is that all disclosures for the purpose of general marketing require prior authorization.

conversion mass

Education 2006: As part of the processes of language change, sometimes the original meanings of native words and other borrowed lexical items may undergo semantic CHANGE; some words may lose their original meanings, become obsolete, archaic, rare, or even just disappear.

-ing count

Atlanta Journal Constitution 1991: Maybe there will be a historical CHANGING of sports teams' names in 1991.

-ing mass

Journal of Information Systems 1992: Whereas traditional rule-based systems require constant CHANGING of the rules to adapt to new situations, a system that reasons from first principles can apply the underlying causal model to the new situations to arrive at solutions.

d. *achievement*: fracture

conversion count

Orthopaedic Nursing 2002: In the case of a FRACTURE, the periosteum is injured upon impact.

conversion mass

Christian Century 1996: These church parties lent the church local forms and regional identities which produced chronic national tensions, and some splinter movements, but no wholesale FRACTURE.

-ing count

Essence 1992: A violation of the father-daughter relationship leads to a FRACTURING of the psyche for both people," says Phillips.

-ing mass

Natural History 1999: Lyell recognized that catastrophes usually leave their signature, for extensive outpourings of lava or widespread FRACTURING of strata by earthquakes resist erasure from the geological record.

e. *semelfactive*: flash

conversion count

Astronomy 1995: These observations imply that both ideas were right: Galileo apparently saw both the meteorlike FLASH of a comet fragment entering Jupiter's atmosphere and then the appearance of the fireball from the explosion.

conversion mass

Newsweek 1990: Assimilating bits of Scorsese, Spielberg and Sam Peckinpah's balletic gift for carnage, Joanou gives us more than stylistic FLASH.

-ing count

Natural History 1990: The snout tapping is exaggerated and repeated frequently, producing a very conspicuous FLASHING of the male's bright flanks and underbelly.

-ing mass

Paris Review 1997: "Look at the snug snug corners and the shiny, dapper sides!" he sang, turning one in the sunlight so as to lose himself in an ecstasy of metallic FLASHING.

Of our 106 verbs, there are roughly 30 that exhibit full paradigms such as those illustrated above.

Is there anything more to be said about the quantification of conversion and *-ing* nominalizations? Clearly, individual conversion or *-ing* nominalizations may have preferences with respect to quantification. So *pay* is always mass, *desire* is frequently mass, but can be count, and *chat* favors count, but is sometimes mass. Similarly, *beating* is always count, *blending* can be either count or mass, and *chatting* is always mass. It is not clear at this point whether there is anything systematic about these quantification patterns, but what does emerge clearly is that quantification is not fixed for the form of nominalization (conversion or *-ing*) as a whole.

6.2 Aspect in conversion and *-ing* nominalizations

As we saw in section 2, to the extent that questions of aspectual interpretation in conversion and *-ing* nominalizations have been pursued in the literature, the claim has generally been that conversion nominalizations have a more bounded/package/instance/portion/perfective interpretation and *-ing* nominalizations an unbounded/ongoing/imperfective interpretation. In other words, the assumption in the literature has been that type of nominalization predicts aspectual reading.

Our data suggest that this simple correlation, as with the quantificational correlations we explored above, does not obtain. Rather, what we find is a much more nuanced matter: it appears that both conversions and *-ing* nominals can be either unbounded or bounded, and indeed that bounded in the nominal sense has two distinct ‘flavors’ that we can discern, either of which can occur with conversion or *-ing* nominals.

Let us first review what we mean by ‘flavors’ of boundedness. At the end of section 3, we raised the question of what we mean by aspectuality in nominalizations and proposed that we would discuss nominal aspectuality in terms of boundedness, where we mean by *bounded* ‘implying a linguistically relevant temporal boundary’ and by *unbounded* ‘not implying a linguistically relevant temporal boundary’. We proposed, following Depraetare (1995) to disassociate temporal boundedness from telicity, so that an event could be both unbounded and telic or bounded and atelic. We must now give some examples that illustrate what we mean by bounded and unbounded in conversion and *-ing* nominalizations. Consider the examples in (21) and (22), all of which contain nominalizations of the verb *kill*, (21) the conversion form and (22) the *-ing* form:

(21) conversion

a. unbounded reading

Bioscience 2002: At the peak of the KILL, we counted only 18 carcasses at the site where thousands had died after Bonnie.

b. bounded reading (completive)

Sports Illustrated 1993: The grebes contained a level of selenium three times greater than that found in birds in 1989, and selenium poisoning is seen as a contributing factor in the massive KILL.

c. bounded reading (package)

Boys Life 2004: "Now we have a real chance for a KILL," River said.

(22) *-ing* nominalization

a. unbounded reading

E: The Environmental Magazine 1998: Defenders has said all along that the biggest threat to wolf recovery would be illegal KILLING, and illegal killing is what results if the public isn't engaged.

b. bounded reading (completive)

America 2006: The reaction of the pope's representative in Anatolia to Santoro's KILLING, however, suggests that the anti-Christian violence was about much more than the cartoons.

c. bounded (package)

Rolling Stone 2006: And for kids who played any part in a KILLING, what awaited them was the world's most draconian verdict: mandatory life in prison without parole, also known as LWOP.

The differences in reading are subtle, but we think significant. In the (a) examples the nominalizations suggest events in progress, processes whose beginning and endpoints are irrelevant; these are therefore unbounded in our sense. In both the (b) and (c) examples the temporal boundaries of the events are relevant; the nominalizations are therefore bounded in our terminology. We believe, however, that the (b) and (c) examples are not bounded in exactly the same way. Note that the verb *kill* has an implied endpoint; *kill* is a lexically telic verb. That implied endpoint is carried over to the nominalization, but it is not always the focus of the nominalization in context. In the (b) examples, we do find a focus on the endpoint: the "massive kill" in (21b) is a done deal, the endpoint has been reached and is the focus, as is also the case in (22b), where it is Santoro's deadness that the Pope is reacting to. In the (c) examples, the nominalization is interpreted more as 'an instance of verb-ing'; the event is temporally packaged, but the focus is not on the implied endpoint. We will call the bounded reading in the (b) examples the *bounded-completive* reading and the one we find in the (c) examples the *bounded-package* reading.

What is interesting here is that the availability of the readings clearly does not follow from the type of nominalization (conversion or *-ing*), since all three readings are available in both sorts of nominalization. Indeed, if either reading is available for the conversion or *-ing* nominalization on a given verb, we might expect that it is possible for the readings of conversion and *-ing* nominalizations in some cases to be indistinguishable. In other words, we might expect to find doublets. And indeed we do:

(23) gurgling/gurgle

The Grim Grotto 2004: The three Baudelaires sighed, and for a few moments the siblings sat quietly on the toboggan and listened to the GURGLING of the stream.

Christian Century 1993: The GURGLE of waste water and the chemical stench punctuated Sister Susan Mika's description of the harsh living and working conditions along the border.

hiring/hire

ESPN 2017: Since the HIRING of Scott Perry as general manager in July, New York has changed course on the asking price for Anthony and has been pushing for a return of assets that Houston is unable to provide.

Sports Illustrated 2016: So Scarlet Knight fans should be happy with the HIRE of Ash, who served as Urban Meyer's defensive coordinator at Ohio State for the past two seasons and led the Buckeyes to consecutive top-20 finishes in total defense.

So we can set aside the existence of a simple correlation between type of nominalization and aspectual reading. But we must still ask some further questions about aspectual interpretation. First, are all three aspectual interpretations always available with both conversion and *-ing* forms? Do we find unbounded, bounded-completive, and bounded-package readings as freely for all verbs as we do for the verb *kill*? Is there any relationship between the lexical aspect of the base verb and the potential aspectual readings of the conversion and *-ing* forms? We turn to these questions in the following sections.

6.2.1 The effect of lexical aktionsart of the base

One clear factor in determining the range of aspectual readings available in conversion and *-ing* nominalizations seems to be the lexical aktionsart of the base verb. We summarize our findings in Table 2:

Table 2.¹²

lexical aktionsart/verb	conversion			<i>-ing</i> nominalization		
	unbounded	bounded-package	bounded-completive	unbounded	bounded-package	bounded-completive
state	10/10	0/10	0/10	5/10	0/10	0/10
semelfactive	5/10	10/10	0/10	10/10	6/10	0/10
activity	29/31	24/31	0/31	29/31	11/31	0/31
accomplishment	17/21	12/21	6/21	19/21	7/21	8/21
achievement	7/13	8/13	7/13	12/13	7/13	8/13

Some patterns that emerge in Table 2 are not particularly surprising. For example, if the base is a state verb, the interpretation of both the conversion nominalization and the *-ing* nominalization is always unbounded. For nominalizations with activity verbs as bases, either unbounded or

¹² The careful reader will note that we do not show all 106 verbs in Table 2. The reason for this is that some of our verbs do not belong clearly to only one aktionsart. For example, *taste* is state in a sentence like *This ice cream tastes funny*, but arguably an activity in *I tasted all 29 varieties of ice cream*. We have therefore omitted from Table 2 verbs whose classifications seemed problematic to us.

bounded-package readings are possible. What we never find are bounded-completive readings. Semelfactives behave exactly as activities do. For nominalizations whose bases are lexical accomplishments and achievements, we again find both unbounded and bounded-package readings, but for some nominalizations bounded-completive readings are available as well. In other words, the bounded-completive reading is only available if the base verb has an implied endpoint. Note that *kill* (illustrated in (21) and (22) above) is rare, in that shows the full paradigm, that is, all three readings for both the conversion and *-ing* nominalization. As we saw with quantification, individual nominalizations can be idiosyncratic about which of the three readings they favor. It nevertheless emerges quite clearly that the lexical aktionsart of the verbal base has some influence on the range of aspectual readings that conversion and *-ing* nominalizations can display.

The form of the nominalization, on the other hand, appears at best only weakly to affect the availability of readings. As Table 2 suggests, either conversion or *-ing* nominalizations easily express the unbounded reading. The bounded-package reading occurs with either kind of nominalization as well, but somewhat more consistently with conversion nominalizations than with *-ing* nominalizations. Given that all three of the readings can be found with either conversion or *-ing* nominalizations, however, we cannot claim that the readings are to be attributed directly to the type of nominalization.

6.2.2 The relationship between context and reading

We now turn to the question of how context influences the aspectual and quantificational interpretations of nominalizations. We find that there are several contextual factors that may influence whether a given conversion or *-ing* nominalization can be read as bounded or unbounded: the adjectives that modify the nominalization, the presence or absence of an of-PP complement to the nominalization, the tense of surrounding verbs, and whether the nominalization is count-quantified or mass-quantified. In addition, there are cases where it appears that the reading follows from encyclopedic knowledge, rather than purely grammatical contextual factors.

6.2.2.1 Modification

Adjectives like *constant*, *prolonged*, *sustained*, *steady*, *long*, *continuous* and the like can induce or enforce unbounded readings in both conversion and *-ing* nominalizations. This unbounding is straightforward when the nominalizations are based on states, activities, or accomplishments. However, the nominalizations may be read as unbounded and iterative if they are based on achievements or semelfactives. (24) illustrates these readings for *-ing* nominalizations and (25) for conversion nominalizations:

- (24) a. unbounded *-ing* nominalization (ordinary unbounded)

Journal of Rehabilitation Research & Development 1997: Any unfavorable biomechanics that prevail during performance of the Biering-Sorensen test are also likely to exert an effect during everyday activities, because in tasks that involve prolonged BENDING and lifting, the upper body must always be supported in addition to any external load.

b. unbounded *-ing* nominalization (iterative)

World Literature Today 1998: After ten minutes of continuous KNOCKING Danny realized that it wasn't a passing train going choo-choo.

(25) a. unbounded conversion (ordinary unbounded)

New York Times 1997: But in Guangdong Province in southern China, there has been a slow SPREAD of so-called open churches, Roman Catholic communities that give fealty to Rome rather than to the Patriotic Association.

b. unbounded conversion (iterative)

Houston Chronicle 1992: The only interference: the constant FLASH from camera bulbs and the few fans with the temerity to speak up.

6.2.2.2 Of-PPs

Of-PPs, which correspond to the internal/object argument of the verb can, on the other hand, induce telicity and therefore make bounded-completive readings possible in nominalizations based on activity verbs if the object of the preposition of is definite and singular. This of course corresponds to the observations of Verkuyl (1972, 1993, 1999) that telicity can be induced in activity verbs by the addition of an object which is singular and definite.

(26) *-ing* nominalization with of-PP and bounded reading

Denver Post 1998: Paul saves Misty from drowning during the SWIMMING of the channel between Assateague to Chincoteague.

(27) conversion nominalization with of-PP and bounded reading

Backpacker 2011: One says that the extra fabric prevented him from being able to see his feet during a CLIMB of the Great White Icicle in Utah.

Note that in the example in (27) the count-quantification of the conversion nouns also helps to suggest the bounded reading, as we will discuss in section 6.2.2.4 below.

6.2.2.3 Verb tense

It also appears that surrounding verb tenses can influence whether a given instance of conversion or *-ing* nominalization be read as bounded or unbounded. Consider the examples in (28), all nominalizations of the accomplishment verb *burn*:

(28)

a. conversion/past tense/bounded-package

Conservationist 1992: It is probable that this area remained in a somewhat open condition for the first 60 years following the initial BURN.

b. conversion/non-past tense/unbounded

Popular Mechanics 2003: This will slow the idle and provide a longer, hotter BURN.

c. *-ing* nominalization/past tense/bounded-completive

CBS_Sixty 1996: This former Area 51 worker says the open-pit BURNING was executed with extraordinary security.

d. *-ing* nominalization/non-past tense/unbounded

BNC Other Pub 1990: Friends of the Earth desperately needs your help now to prevent the greatest man-made ecological catastrophe yet known: the systematic BURNING of the Amazon Rainforest.

In (28a), the past tense of *remain* suggests that we read the conversion noun *burn* as temporally bounded, an instance of burning that has already happened. In (28b) the tense is non-past and suggests a process rather than a completed event. Similarly for the *-ing* nominalizations, in (28c) the past tense suggests a completed event, (28d) an on-going process with no temporal boundaries in view. Note that our point is not that verb tense determines the reading, just that in some instances it contributes to the reading.

6.2.2.4 Quantification

Another contextual factor that contributes to our reading of nominalizations as bounded or unbounded is whether they are count-quantified or mass-quantified in a particular context. Recall that we argued in section 6.1 that quantification is not correlated with the form of nominalization (conversion or *-ing*). Either conversion forms or *-ing* nominalizations can be count or mass, with nominalizations of some verbs showing preferences for one sort of quantification or the other and nominalizations of other verbs being rather freer in their choice of quantification. For those that are rather free in their choice of quantification, we sometimes find that count quantification can contribute to a bounded reading whereas mass quantification of the same nominalization contributes to an unbounded reading. Consider the examples in (29) and (30):

(29) conversion

a. *Massachusetts Review 1996*: Once or twice he made love to Mimi with a BURN of wintry anger that scared him.

b. *Associated Press 2002*: The vaporizing of air conditioning was also a sign of some BURN.

(30) *-ing* nominalization

a. *BNC Fiction 1993*: A low pall of smoke hung over the nearby buildings; there had been a dawn funeral, a BURNING.

b. *Science News 1990*: Those agencies, which once emphasized the destructive potential of forest fires with publicity campaigns featuring such symbols as Smokey the Bear, today recognize that the forest can actually benefit from some BURNING.

In the (a) examples, the count-quantification helps to suggest a bounded-package reading. The (b) examples have mass quantification and are more comfortably read as unbounded. Again this correlation between count-quantification and bounding, mass-quantification and unbounding is a tendency rather than a hard and fast correlation.

In fact, the ability to occur in the plural is a hallmark of count quantification, and pluralization can lead to an unbounded iterative reading for both conversion and *-ing* nominalizations, especially if they are based on semelfactive verbs. For example, with a semelfactive verb like *knock*, pluralization results in an interpretation of repeated action regardless of whether we have a conversion or an *-ing* nominalization:

(31)

Fantasy & Science Fiction 2001: I could hear my breathing and the clicks and KNOCKINGS as the trees contracted with the night.

People 1996: Her KNOCKS turned into pounding; her voice became furious.

What this suggests, again, is that elements of context are instrumental in building the ultimate construal of any given nominalization.

6.2.2.5 Encyclopedic knowledge

Finally, we come to the role of encyclopedic knowledge in influencing the reading of nominalizations as bounded or unbounded. Consider the example in (32):

(32)

Science News 1998: Ongoing volcanic eruptions, the SHIFTING of the continents due to the movement of tectonic plates, and other large-scale makeovers have erased Earth's original surface.

The verb *shift* is typically a lexical achievement. It has an implied endpoint, and we might therefore be inclined to interpret the *-ing* nominalization as bounded. Further, the tense is present perfect, also nudging us towards a bounded interpretation. But for the geologically savvy, the knowledge that continents are always undergoing infinitesimal changes in position, pushes us in the direction of an unbounded interpretation.

Similarly, we might expect the conversion noun *stir* to have an unbounded reading, as it does in (33a), but the context in (33b) suggests that what is involved is a single motion of the wings, that is, a bounded reading

(33) a. *Lethal Rider 2012*: His mind was whirling in a STIR of a thousand thoughts, and he couldn't focus.

b. *San Francisco Chronicle 1990*: One of the latest developments in physics is chaos theory, with its story that the STIR of a butterfly's wings could set in motion a chain of events resulting in a storm on the other side of the planet.

The bounded reading in the case of (33b) depends on the general context available in the discourse about physics, rather than in any strictly grammatical feature of the sentence in which *stir* is used.

7. *Theoretical implications*

We have found that there is no correlation between the type of nominalization (conversion or *-ing*) and its reading as referential or eventive: most conversion and *-ing* nominalizations have the potential for either interpretation. It also seems clear that verbs of any lexical aktionsart can occur as either conversion or *-ing* nominalizations. We find as well that there is no correlation between type of nominalization and mass or count quantification: conversion nominalizations can be count or mass as can *-ing* nominalizations. Nor is the type of nominalization tied to either bounded or unbounded readings, where by bounded we mean having a clear temporal endpoint: conversion nouns may be bounded or unbounded as may *-ing* nominalizations. However, we do find some effect of the aspectual class of verbal bases on the range of aspectual readings, in the sense that only nominalizations based on accomplishments or achievements display bounded-completive readings. And finally, a range of contextual features can affect the aspectual reading of both conversion and *-ing* nominals, including temporal modifiers, verb tense, quantification, and encyclopedic knowledge.

The question we must turn to now is what the semantic contribution of conversion and nominalizing *-ing* amounts to. Obviously any theory would have to acknowledge the role of these nominalizers in category change. But it is equally clear at this point that, at least in English, the means of nominalization does not determine whether the nominalization is read as referential or eventive. Nor does the means of nominalization determine either quantificational or aspectual features of the semantics of nominalization.

Our study suggests then that we should rule out any analysis in which *-ing* is introduced into a syntactic tree as head of some sort of functional projection that fixes its aspectual reading, for example, AspP, along the lines of the analysis that Iordachioaia & Soare (2008) propose for one of the Romanian nominalizers that they discuss. We must also reject Alexiadou's (2001, 51) proposal that *-ing* is an imperfectivizer or Borer's (2013, 162) proposal that *-ing* creates 'homogenous' or atelic nominalizations. Generally, we must reject the idea that conversion and *-ing* are associated with specific quantificational properties by virtue of being embedded in specific types of Number phrases. Nominalizers are not semantically rigid functors that resist coercion as Borer (2005, 2013) claims. Instead, any adequate theoretical modeling of the semantics of nominalization must be able to accommodate their ability to undergo both aspectual and quantificational coercion in context. In effect, theoretical frameworks like Pustejovsky's Generative Lexicon (Pustejovsky 1995) or Lieber's Lexical Semantic Framework (Lieber 2004, 2016) that build in mechanisms whereby the readings of nominalizations can be built in context offer more promising avenues for the formal modeling of this intricate facet of lexical meaning. We must leave such modeling to further research, however.

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