Individuating the Abstract

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Abstract. Despite the vast count-mass literature, determining why an abstract noun is countable (*arrival*) or uncountable (*happiness*) remains largely unexplored territory. This paper examines several proposals which attempt to derive the countability of deverbal nouns from some aspect of the derivational source, including the well-known hypothesis by Mourelatos (1978) relating countability to aktionsart: nouns derived from states/activities are uncountable, while those derived from accomplishments/achievements are countable. Broad-scale corpus work shows that such hypotheses are not borne out. A second study of abstract nouns from four different semantic domains (bodily states and mental states (*sleep*), mental properties (*intelligence*), behavioral properties (*kindness*) and psych-nouns (*irritation*, *fear*)) demonstrates that the noun's interpretation in a given context determines its countability, in turn influenced by a complex set of factors including lexicalization patterns, ontological contrasts, and world knowledge.

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1. The challenge of abstract nouns for theories of countability

Despite the vast literature on the count-mass distinction, the exact nature of what guides countability for abstract nouns is currently little understood.[1] Although a wide variety of positions have been taken on which contrasts underlie countability, most theories of countability primarily consider nouns designating concrete entities, such as *dog*, *water*, or *furniture*. Facts about these types of objects are often taken to be important for countability in general—for instance, the ontological contrast between objects and substances, on some accounts, is relevant for the contrast between countable and non-countable nouns, respectively (Link, 1983). Yet, it is unclear how most of these theories can be extended to abstract nouns such as *peace* or *justice*. Different researchers have taken different stances as to whether their treatment of the countability of nouns for concrete entities can be extended to abstract entities: Link (1983) sets up a system which is only concerned with concrete objects (and likewise in Grimm (2012) I give a disclaimer at the outset that my analysis only extends to concrete nouns), while Chierchia (1998, 69) claims that his system would extend to abstract terms, yet only devotes a paragraph to it. Despite the meager attention paid to the countability of abstract nouns, it is vital to come to an understanding of these nouns since their behavior frequently goes against the grain of purported generalizations of countability. For instance, abstract nouns often counter-exemplify properties which are, at least in the formal semantics literature, typically taken to be sufficient to distinguish countable and non-countable nouns.

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The work of Quine (1960), Cheng (1973), Link (1983), and those following them, all couch their explanations of the countable/non-countable distinction in second-order mereological properties such as ATOMICITY in (1), which distinguishes countable nouns, and CUMULATIVITY and DIVISIBILITY, which distinguish non-countable nouns, given in (2) and (3).

(1) Atomic(P) = $\forall x[P(x) \rightarrow \exists y[y \leq x \wedge Atomic(y, P)]]$

(2) Cumulative(P) = $[P(x) \wedge P(y) \rightarrow P(x \oplus y)]]$

(3) Divisive(P) = $\forall x[P(x) \rightarrow \forall y[y < x \rightarrow P(y)]]$

All of these properties have wide enough coverage in the domain of concrete objects as well as sufficient intuitive appeal that many researchers continue to countenance their well-known problems. Yet, the application of these properties to abstract nouns gives rise to even more difficulties, since the counter-examples become more plentiful and the intuition behind the application of these properties is often absent for various abstract nouns. For instance, the property atomicity picks out those entities in the world for which no proper part of that entity falls under the same description as the entity itself. Explaining countable nouns as related to atomicity of course performs adequately for cases such as *dog*. Yet, many strictly countable abstract nouns often do not obey this principle: eventive nouns such as *a trip* may contain many smaller trips (e.g. a long trip through the Caribbean may contain many short day trips onto different islands) and in the same way *a requirement* may be comprised of several requirements. Even the choice to use part-structures in the first place, which is entirely natural for representing concrete objects where the parts are straightforward to determine, becomes much less natural for nouns such as *resentment* or *dissent*, where it is not clear exactly what the criteria are for determining what constitutes a part.

Abstract nouns fit just as awkwardly with several other claims about the general nature of countability. For instance, many researchers have suggested that nearly all nouns have countable and non-countable uses and have further claimed that flexibility of nominal interpretation to be a hallmark of nominal reference (Pelletier and Schubert, 2004; Borer, 2005; Chierchia, 2010). Yet, unlike the canonical examples where discrete concrete entities may be reinterpreted as substances, as shown in (4-a), many event nouns are very difficult to "grind", as already noted by Ware (1975) and shown for *arrival* in (4-b). Further examples are easy to find, such as *trick*, *act*, *blink*, *smile*, or *run*.

(4) a. There was dog all over the road.
b. ??There was arrival all over the airport.

Although data from abstract nouns has not been directly confronted in the countability literature,

several researchers have discussed the countability of deverbal (abstract) nouns and have related the countability of the derived noun to some aspect of the derivational source. In section 2, I examine three hypotheses relating to the countability of deverbal nouns, none of which hold up under closer empirical scrutiny. In section 3, I present several small case studies showing how particular countability contrasts follow from semantic contrasts relevant to the domain at hand, but which are nonetheless distinct from nearly all the semantic contrasts which are typically assumed to underlie countability. The upshot will be that no single, overarching generalization determines countability for abstract nouns. Instead, several more local generalizations tied to semantic domains can be observed to be in effect. This paper will not exhaust the countability contrasts present for abstract nouns, but will hopefully stake out several paths for future research.

2. Derivational approaches

This section discusses three hypotheses that relate the countability of an abstract noun to some facet of its derivational history. I examine (i) whether countability can be derived from the aktionsart of the verbal base, (ii) whether the derivational suffix has a determinate influence on the derived noun's countability and (iii) whether if a nominalization has arguments, i.e. is a complex event nominal in the sense of Grimshaw (1990), then it is non-countable. The data show that none of the phenomena is fully predictive of a noun's countability status.

2.1. The Aspectual hypothesis

A large number of authors, such as Mourelatos (1978), Bach (1986), Krifka (1989), Jackendoff (1991), and Brinton (1998) among many others, propose a "cross-categorial" analogy between the categories of verbal aktionsart and nominal countability. All of these theories vary in the exact analogies they make between the verbal and nominal domain, yet they agree on the basic analogy between discrete events (accomplishments and achievements) and count nouns in contrast to activities and states and non-count nouns. This section investigates a strong claim related to the cross-categorial analogy: the aktionsart of a deverbal noun's derivational source determines the noun's countability status.

The connection between aspect and countability was first argued for in detail in Mourelatos (1978), which asserts that a strict correspondence between verbal aspect and nominal number can be found in nominalization patterns: "Corresponding to an event predication there is a nominalization equivalent in which the original verb appears as a gerund or deverbative noun (suffixes typically *-ion*, *-ment*, *-al*, *-ure*) that governs an existential construction of the verb "to be." If the number of occurrences is specified by an adverb in the original version, the number appears as a cardinal numeral modifying the gerund in the nominalized version. If the number is not specified, the existential construction has the characteristic import of the existential quantifier,"There is at least one.. . ."' (p. 425) The examples from Mourelatos (1978, p. 425) below demonstrate the intended

equivalence.

(5) a. Vesuvius erupted three times. ↔ There were three eruptions of Vesuvius.
b. Mary capsized the boat. ↔ There was a capsizing of the boat by Mary.

Mourelatos goes on to argue that such transformations are not possible with process or state predications, as shown in (6). Instead, process and state predications require "mass-quantified transcriptions", as shown in (7).

(6) a. John hates liars. ↮ There is a hating by John of liars.
b. Helen dominates her husband. ↮ There is a dominating by Helen of her husband.

(7) a. John hates liars. ↔ There is hate by John of liars.
b. Helen dominates her husband. ↔ There is domination by Helen of her husband.

Similarly, Brinton (1998, 37) explicitly puts forth that the aktionsart of a verb determines the countability of any noun derived from it. Verbs designating states and activities derive non-countable nouns (*live* > *a quantity of/*one living* and *run* > *much/*a running*), while verbs designating accomplishments and achievements derive countable nouns (*perform* > **a good deal of/one performance* and *arrive* > **much/an arrival*).

The examples given by the various authors are initially persuasive, yet it remains to be seen whether this hypothesis can be maintained across the lexicon—for such examples only provide evidence for a tiny portion of the larger population of nominalizations. I will use two databases to examine if there is a straightforward relation between aktionsart and countability. First, the CELEX database (Baayen et al., 1993) provides derivational and compositional structure of English words along with syntactic information such as word class and word class-specific subcategorizations. Importantly, CELEX provides a classification of nouns into *countable* and *uncountable*, as well as into minor categories such as *pluralia tantum* and *group nouns*. Second, the LCS database (Dorr, 2001) contains "Lexical-Conceptual Structures" organized into semantic classes that are a reformulated version of those in Levin (1993), and further contains a classification of verbs in terms of aspectual category (Dorr and Olsen, 1997).

I extracted from the English portion of CELEX the set of deverbal nouns along with all information relating to noun's derivational history and countability, e.g. for the noun *adoration* I extracted the information that it was derived from the verb *adore* with the suffix *-ation* and was classified as *uncountable*. I hand-corrected the extracted nouns, as it was necessary to exclude many items, e.g. duplicates (*lender* and *money lender*) or cases such as *combination-lock*, which is listed as derived from *combine*, but which is not a noun relevant to the hypothesis at issue. From the

LCS database, I extracted aspectual information for each predicate. I also excluded all the entries where there was ambiguity in the countability or aspectual classification, setting aside nouns which CELEX classified as both countable and uncountable and predicates which the LCS database classified as having multiple aspectual categories. The final database had 1975 nouns.

Figure 1 displays the relation between countability classification and aktionsart categories for derived nouns in this database. The primary result visible in the figure is that countable interpretations dominated in general, regardless of the aktionsart class of the base verb. This is clearly unexpected under the aspectual hypothesis. Had there been an influence of aktionsart, a greater number of exclusively non-countable nouns than exclusively countable nouns would have been visible for the *state* and *activity* categories. Still, a very weak form of the hypothesis was (partially) validated in as much as states have proportionally fewer exclusively countable nouns than, e.g., accomplishments (χ^2 = 4.9, df = 1, p$<$ 0.05). Overall, the analyses which make a link between aktionsart and countability seem to be pointing out something valid, for as will be discussed in section 3 nouns which refer to states are very often non-countable, but the landscape is much more complicated than a strictly derivational analysis would indicate. This is further complicated in that the hypothesis is silent on the many nouns, around one third of the total in this study, which have both countable and uncountable uses.

2.2. Patterns of deverbalization

Brinton (1998) puts forth a separate claim relating a deverbal noun's countability status to the means by which it is deverbalized. Brinton (1998) claims that latinate suffixes, such as *-age*, *-al*, *-ion*, *-ment*, and *-ure*, preserve the aktionsart of the verbal source. The examples in (8) are reproduced from Brinton (1998, 47) and are intended to demonstrate this claim for the latinate suffixes.

(8) a. *State and activity sources*: a lot of guidance/*several guidances, some leakage/*many leakages
b. *Accomplishment and achievement sources*: a few conquests/*an amount of conquest, an appearance/*much appearance

In contrast to latinate suffixes, Brinton (1998) argues that zero-derived nominalizations consist in primarily countable nouns, and thus that "this deverbalizing device 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" (p. 49).[2]

[2]Brinton (1998) also hypothesizes that *-ing* does affect the underlying aktionsart, "converting a situation into an activity, of making the situation durative, atelic, and dynamic" (p. 48). My dataset did not allow me to properly test this aspect of her hypothesis.

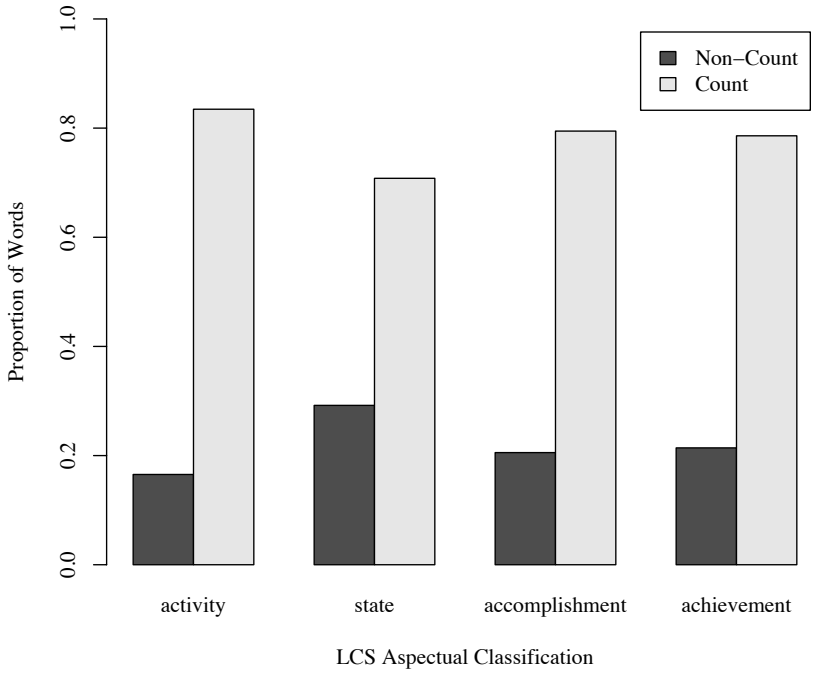

Figure 1: Distribution of countable and non-countable nouns across aktionsart categories for derived nominals

Suffix	*-age*	*-al*	*-ance*	*-ant*	*-ation*	*-er*	*-ery*	*-ion*	*-ment*	*-or*	*-ure*
Non-count	13	6	13	0	38	1	8	146	41	1	6
Count	2	4	3	29	6	546	5	13	12	111	2
Count and Non-Count	11	15	19	5	111	13	9	301	74	1	12

Table 1: Distribution of Count and Non-Count Nominalizations by Deverbalizing Suffix

The data assembled in section 2.1 did not support a view upon which the countability status of a noun could be calculated from the aktionsart of the verbal source and the suffix. Quite often, for a given type of derivational source and a given suffix, one finds conflicting outcomes. For instance, *resent* and *require* are both stative and classified as such in the LCS database, but *resentment* is uncountable while *requirement* is countable.

Table 1 shows the distribution of countable and uncountable nouns in CELEX by suffix. Here, for completeness, I have included the data for nouns that were considered countable and uncountable. As can be seen in the table, when considering only pure countable and uncountable classes, many affixes show strong biases towards one of the two classes. Yet, there is much variation and few absolutes that can be seen at the level of granularity of this study.

Space prohibits discussion of each suffix, but overall, closer examination showed that the countability preference ultimately follows from the nature of the referent. The clearest pattern in the data is that *-ant*, *-er* and *-or*, all of which typically produce agent or instrument nominalizations such as *winner*, are nearly all exclusively countable. Still, there are exceptions such as *thinner*, as in “paint thinner”, which is uncountable due to the fact that it is a liquid.

Turning to zero-derived nouns, Figure 2 shows the distribution of nouns according to countability classes and aktionsart for zero-derived nouns. The distribution is very similar to that of all nouns in Figure 1, and so the data does not support a closer association between zero-derived nouns and countable interpretations than is the general case for derived nouns. Further, there are many nouns which are both zero-derived and non-countable, such as *blame*, *chatter*, *dissent*, or *swagger*, which do not support the hypothesis that zero-derivation results in adding a feature of telicity.

In sum, the pattern of deverbalization did not appear to have a completely determinate effect on the countability of the derived noun, even if sizable biases were present for particular suffixes as witnessed by *-er* or *-or*.

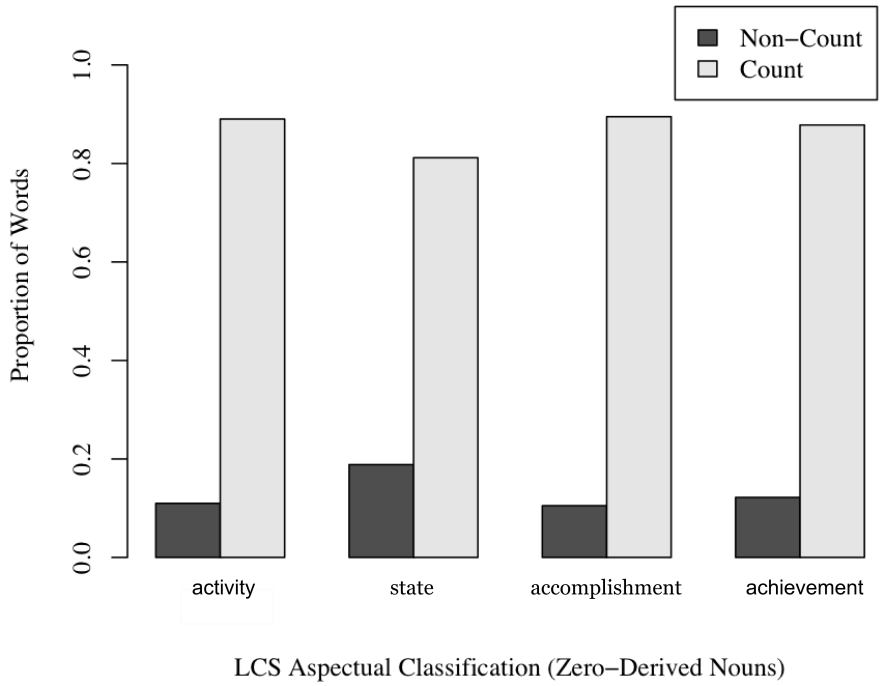

Figure 2: Distribution of countable and non-countable nouns across aktionsart categories for zero-derived nominals

2.3. The 'Complex Event Nominal' hypothesis

A very different literature on deverbal nouns sets out yet another hypothesis for deriving the countability of deverbal nouns from their verbal source. Grimshaw (1990) argues nominalizations are ambiguous between different readings, exemplified in (9), reproduced from Alexiadou and Grimshaw (2008). *Examination* is a complex event nominal (CEN) by virtue of having a "complex event interpretation" (involving participants) in (9-a), while *examination* in (9-b) is argued to refer to an event without an articulated event structure. In (9-c), *examination* refers to a physical object, again not possessing event structure, thereby lacking arguments.

(9) a. The examination of the patients took a long time. (CEN-nominal)
b. The examination took a long time. (Simple Event Nominal)
c. The examination was on the table. (Result Nominal)

Grimshaw (1990) argues that a cluster of properties distinguishes CEN-nominals from non-CEN-nominals, whether Simple Event Nominals or Result Nominals. One of these properties is number: CEN-nominals purportedly only occur in the singular, i.e. are "mass" nouns, while Simple Event Nominals or Result Nominals do have a singular/plural contrast.

Grimm and McNally (2013) conducted a corpus study on deverbal nominalizations, using the COCA corpus (Davies, 2008), collecting samples of up to 1000 instances of 150 different nouns with CEN-nominal uses. Their results showed that the alleged correspondence between nominalizations with and without arguments and the ability to pluralize was not empirically accurate. First, many CEN-nominals (20%) were observed to occur at least once in the plural. More generally, the presence or absence of an argumental prepositional phrase had no effect on its occurrence in the plural. Nouns with high rates of singular (plural) occurrences when PPs were present also had high rates of singular (plural) occurrences when no PPs were present. For instance, 98% of the occurrences of *allegation*, both with and without an *of*-phrase, were singular, while for *observation*, 46% of the occurrences, with and without an *of*-phrase, were singular. Grimm and McNally (2013) determine for nearly all the nominalizations considered, there is no significant difference between the number of occurrences in singular and in plural of the CEN-nominal and the number of occurrences in singular and in plural of the non-CEN-nominal. (The only exceptions were *application*, *assessment*, and *examination*—all of which have substantive uses in a non-eventive result reading.) The conclusion of this study is again that no overarching derivational pattern is directly responsible for a deverbal noun's countability status.

3. Count/non-count contrasts across different lexical semantic classes

The negative results of the preceding section might cause skepticism as to whether systematic principles of countability can be elucidated for abstract nouns. This was the conclusion reached by

Payne and Huddleston (2002) who provide an insightful and wide-ranging discussion of countability, during which they briefly consider the countability of abstract nouns, noting the several types of polysemy. Payne and Huddleston (2002) observe that many abstract nouns are polysemous between an abstract, non-countable interpretation and an eventive, countable interpretation, which they demonstrate with the examples in (10) in contrast to the examples in (11) where the extension to eventive readings does not obtain (Payne and Huddleston, 2002, 337).

(10) a. Considerable **injustice** was revealed during the enquiry.
b. Two fundamental **injustices** were revealed during the enquiry.

(11) a. Serious **harm** was done to the project's prospects.
b. *Two serious **harms** were done to the project's prospects.

Payne and Huddleston (2002, 337) conclude that "... this extension is not regular and predictable. Although events in which injustice is instantiated are countable, events in which harm is instantiated are not." They then claim that the same pattern is observed with deverbal abstract nouns, as in (12) and (13)[3].

(12) a. Full **discussion** of the land in question is vital.
b. Two **discussions** of the land in question took place.

(13) a. **Permission** is required.
b. ?Two separate **permissions** are required.

One may argue that perhaps the comparison set up between *injustice* and *harm* is not valid, since they are two very different words for which a number of factors may come into play. Yet, it is possible to find even more acute minimal pairs which make the same point. For instance, although *injustice* has an eventive countable reading, *justice* does not, as given in (14).

(14) *Two considerable **justices** were achieved during the enquiry.

It is difficult to conceive of an *a priori* reason why *justice* and *injustice* should contrast so clearly: both words presumably agree as to the type of meaning conveyed on their non-countable abstract readings. It is unclear on any strictly derivational account why one would allow countable readings but the other not.

[3]Although it is possible to find plural forms of *permission*, especially in documentation concerning permissions for computer files, these uses are clearly not eventive.

Payne and Huddleston (2002) go on to observe that abstract nouns may also have a "result" sense, and claim that "nouns which denote results ... are generally more countable than those denoting events" (p. 337), which they exemplify with (15).

(15) a. Necessity is the mother of invention. [abstract, non-count]
b. ?There were two separate inventions of the light bulb. [event, count]
c. Edison was honoured for three separate inventions. [result, count]

Again, this may not be a very telling example, for the particular meaning of *invention* guarantees that it is overwhelmingly used to describe unique events, since entities are (typically) invented only once. If a plausible context is provided, a countable reading is possible, as in (16).

(16) Oftentimes when an inventor in one part of the world begins working with one idea, other inventors simultaneously and independently develop similar ideas. This happened with the **inventions of calculus** (Leibnitz and Newton) and the electric light bulb (Edison and Swan). (from *Automated Lighting: The Art and Science of Moving Light in Theatre, Live Performance and Entertainment* by Richard Cadena, via Googlebooks.)

Thus, it remains an open question whether a result sense of an abstract noun, in and of itself, is *more* countable than an event sense of an abstract noun.

The next sections of this paper examine different shifts in meaning and countability status by examining different lexical semantic domains. I provide three brief case studies based on corpus work of different lexical semantic domains that reveal even more ways in which abstract nouns can be individuated. I argue that the countability of abstract nouns is determined in different ways depending on the lexical semantic domain at issue. When remaining within a particular domain, principled patterns of polysemy emerge. I then provide a sketch of how these patterns can be incorporated into formal semantic systems as appropriate.

For this second set of studies, I examined countability contrasts in four semantic domains: bodily states and mental states (*sleep*), mental properties (*intelligence*), behavioral properties (*kindness*) and psych-nouns (*irritation*, *fear*). I selected 10 different nouns for each of the domains. To base the selection of nouns in an independent categorization of nouns, I selected nouns falling under relevant WordNet (Princeton University, 2010) categories, e.g. *noun.cognition* and *noun.feeling*. Then for each of the nouns, I examined up to 200 singular and 200 plural occurrences within the COCA corpus, although many nouns had far fewer occurrences. When I did not find any countability contrasts present in the COCA corpus, I then supplemented these searches with Google searches.

Even though these nouns are of quite a different type than typically investigated in the countability literature (viz. *dog* or *water*), I have attempted to integrate these observations into a formal treatment which retains the spirit of the traditional analyses. In the following, I assume a standard mereological framework for objects and events (Krifka (1989) inter alia). I also assume, following Krifka (2008), that the plural operator presupposes a discrete set, i.e. a set of non-overlapping individuals.

3.1. Bodily and mental states and their episodic readings

Bodily and mental states, such as *sleep*, *hunger*, *excitement*, *alertness*, *fatigue*, *rage*, *drunkeness*, etc., primarily display a non-countable use designating a state, as exemplified in (17-a) where it co-occurs with *much*, a clear trait of non-countability. In (17-b), the plural *sleeps* is eventive—describing many sleeping events involving the same individual. Accordingly, the ontological contrast between states and events does appear to be relevant for the countability of certain abstract nouns, even if the aktionsart of a derived nominal's verbal source does not reliably determine the nominal's countability status as demonstrated in section 2.

(17) a. After **much sleep** yesterday, everyone is wide awake this morning and in high spirits. (Google)
b. Around **the sleeps of a five week old baby**, the delicate and dusty songs were recorded anywhere that was far away enough as not to wake her. (Google)

The two uses of *sleep* in (17) are reminiscent of non-countable substance nouns which also admit of two uses: to designate the substance itself, e.g. *much water*, or to designate "packages" of the substance, e.g. *two waters* (see Pelletier and Schubert 2004 and Wiese and Maling 2005 for discussion and references). It is straightforward to give an analogous meaning shift in the domain of states and events, which I will call EPISODIC PACKAGING. I first define the maximal episodic extension of a state s (relative to a property P):[4]

(18) $\text{MaxEpisode}(e_{max}, P) = P(e_{max}) \wedge \forall s[P(s) \wedge \text{Overlap}(s, e_{max}) \rightarrow s \leq e_{max}]$

Episodic packaging of nominal predicates such as *sleep* simply restricts the predicate's domain to maximal episodes, which accordingly results in a domain consisting of non-overlapping entities,

[4] Although this analysis follows the standard mereological treatment of the nominal domain, another option would be to use mereotopology as in Grimm (2012). In that treatment, countable predicates require maximally self-connected wholes, which in the present case corresponds to requiring maximal events. Under that treatment, one would not need a separate notion of maximal event, as it comes built-in along with a mereotopological notion of a whole which is taken to underlie countable individuals.

satisfying the presupposition of the plural operator. This coercion appears to be generally available for state-denoting nouns, although often requires substantial context.[5]

In sum, by restricting attention to a particular lexical semantic domain, the ontological contrast between states and events can be seen to be relevant for the non-countable/countable contrast, at least within the domain of bodily and mental states. Crucially, however, the contrast occurs for the same word—even though the noun *sleep* is derived from a stative predicate, under an eventive construal it receives a countable reading. Thus, whether the nouns such as *sleep* are ultimately interpreted as a state or as an event determines their countability status.

3.2. Mental and Behavioral Properties: Anchoring in Participants and Events

I now turn to nouns that designate mental properties, such as *intelligence*, *ignorance* or *creativity*, or behavioral properties, such as *kindness* or *honesty*. All of these nouns have a non-countable use designating the property in question (e.g. *Kindness is a virtue*.). Yet, the two types of nouns differ in the countability contrasts they permit. The countable reading may be relative either to an event or to a participant, and I will refer to the general process of reifying a property with respect to another individual, whether an event or a participant, as ANCHORING.

Nouns describing mental properties permit PARTICIPANT-ANCHORING, such as *intelligences* which designates intelligence with respect to different individuals. Although such uses are rare, they do occur felicitously as shown in (19)–(21).

(19) Please, let's not insult **both our intelligences** by pretending this is open to question. The desire to provoke a reaction, preferably an over reaction, is glaringly obvious. Seeing this does not require being [Osama Bin Laden]'s secret pen pal. (Google)

(20) A young deaf boy is discovered dead. Warrick, Sara, and Grissom handle this case, dealing with **their ignorances** about the deaf community. (Google)

(21) We are a mother and daughter team that have decided to put **our creativities** together and make a business that is 100% made in the USA. (Google)

[5] I note in passing another countability contrast observed for nouns such as *sleep*. The example in (i) is a plural occurrence of *sleep*; however, *sleep* in this sentence doesn't refer to a particular sleeping event, but rather has a meaning closer to "habitual sleep" which is then further differentiated relative to different individuals. Further research is required to isolate exactly how this reading is related to the other readings of *sleep*.

(i) This disease has ruined **the sleeps of many people**. (Google)

Nouns describing behavioral properties (*kindness*) allow for still different individuation possibilities. These nouns allow EVENT-ANCHORING uses in which reference is made to events manifesting the named quality, as shown in (22)-(23).

(22) Still, with a motorcycle she could leave the city on weekends, get away from **the often overbearing kindnesses of her boarding family**, the Harmses. (COCA)

(23) And this in turn permitted **some alarming honesties** to be committed in public. (Christopher Hitchens, *No one left to lie to: the triangulations of William Jefferson Clinton*, via Googlebooks.)

It appears that for a given noun within these noun types, only one type of anchoring is licensed: for mental property nouns, participant-anchored readings were found but not event-anchored readings, while for behavioral property nouns, event-anchored readings were found but not participant-anchoring readings. Which extension is licensed appears to depend on the lexical semantics of the noun type. Nouns which describe behavioral properties are intrinsically related to events. For instance, *kindness* describes a quality of social interactions, which are events. It is sensible that such nouns have an extended use for events which manifest this quality. In contrast, the availability of participant-anchoring appears to be correlated with whether the noun is intrinsically related to participants. For instance, *intelligence* is inalienably possessed, and as such the possessor is already presupposed in the meaning of the noun. If more than one possessor is identified, as is the case in examples (19)–(21), then a countable interpretation can be achieved.

While the referents of the instantiations of the property are intuitively clear, what the bare use refers to is less so. The non-countable use where the noun designates the property in question is reminiscent of a Carlsonian kind (Carlson, 1980), a proper name of a property, as it fulfills at least some of the diagnostics (e.g. *Kindness is rare.*). However, it is unclear if properties such as *kindness* or *intelligence* are in every respect like Carlsonian kinds, given the many differences that appear as well—such as the ability for these property terms to occur bare in the singular. It is possible that the two could be related by some more general notion, such as that of a CONCEPT (Krifka, 1995), but for the moment I will distinguish the two.[6]

I now provide a sketch of how to integrate these observations into a formal semantic system. Taking inspiration from Koontz-Garboden and Francez (2010), who provide a straightforward integration of property concepts into a standard model-theoretic framework, I will take property concepts to denote "primitive properties" which they treat as individuals of type p, a subtype of e. They define instantiations of the property as $^{\cup}p$, equivalent to $\lambda x[\pi(x, p)]$, the set of entities which possess p (where π represents the possession relationship (Barker, 1995)).

[6]Some link between these properties and a kind interpretation is necessary, however, given that, for many nouns, a sub-kind interpretation is readily available, e.g. *the seven (kinds of) intelligences*.

Given these additional distinctions, the countability facts can be accounted for in a natural way. When nouns designate property concepts directly, pluralization fails since the referent of the property concept, the "primitive property", is unique. Instantiations of properties, however, yield potentially countable sets—but what types of instantiations are permitted is restricted by the lexical semantics of the noun. For *intelligence* and other inalienably possessed properties, $^{\cup}p$ realizes the set of participants which possess the property, i.e. $\lambda x[\pi(x, p)]$ ranges over human individuals. Behavioral properties instead require events which possess the property, i.e. $^{\cup}$*kindness* $\rightsquigarrow$ 'acts of kindness', i.e. $\lambda x[\pi(x, p)]$ ranges over events. In both cases, instantiation of the property results in a predicate comprised of discrete individuals, allowing pluralization. In the case of event-anchoring, the derived set is comprised of events, which are by hypothesis discrete. In the case of participant-anchoring, the derived set is of participants which instantiate the property, and of course the human possessors are by their nature distinct from one another and do not overlap.

At this point, one might question the necessity of this additional machinery instead of deriving the availability of event-based readings from a better known distinction in the semantics literature, namely the stage-/individual-level distinction (Carlson, 1980). Indeed, the possibility of event-based readings appears to be at least partially correlated with the stage-/individual-level distinction. Recalling that stage-level predicates (*drunk*) are true of a temporal stage of its subject, while individual-level predicates (*intelligent*) are true throughout the existence of an individual, one could propose that event-anchoring occurs most happily with nouns related to stage-level predicates, for which multiple stages are then countable. This gives a straightforward explanation for the availability of countable interpretations of otherwise stative nouns such as *drunkenness*. This would also give a straightforward explanation for the lack of an event-based reading for *intelligent*—it does not designate stages which can be then quantified over. Yet, this correlation is not straightforward and at best partial. Aside from issues about the stage-/individual-level distinction not always being so clear-cut (see Jäger 2001 and references therein), the relation between stage-level predicates and event-anchored readings is most likely only a necessary, but not a sufficient condition. Although *drunkennesses* finds a ready interpretation, it is more difficult to place *nakednesses* (and I was not able to find a convincing example of its use). The opposite direction—that individual level predicates lack the event-anchored reading—does not hold either. While this is plausible for *intelligence*, *kind* patterns with individual level predicates for many of the diagnostics, but *kindnesses* is permissible with an eventive reading.

In sum, the domain of mental and behavioral properties manifests a different range of countability contrasts and types of polysemy than was observed for bodily and mental states. Comparing the two domains underscores the importance of examining countability from the vantage point of particular lexical semantic domains.

3.3. Psych-nouns

I now turn to psych-nouns, i.e. those nouns which designate psychological states or events: *annoyance*, *despair*, *fear*, *sorrow*, *pride*, etc. The central contrast at work in the domain of psych-predicates, and consequently for psych-nouns, is between the EXPERIENCER-STATE and STIMULUS, by which I mean the emotional state of the participant and that which evokes the emotion, respectively. For psych-nouns, the countability status of a noun hinges upon whether a noun either lexicalizes, or is interpreted as designating, a stimulus or an experiencer-state: nouns which designate the stimuli are always countable while those designating the experiencer-state are primarily uncountable.

Nouns may unequivocally lexicalize the stimulus or the experiencer-state. Although nouns which unequivocally lexicalize the stimulus are rare, *irritant* is an example. *Despair* is an example of a noun which unequivocally lexicalizes an experiencer-state. Very frequently, a noun is polysemous between experiencer-state and stimulus, and depending on the construal, the occurrence is non-countable or countable, respectively. For instance, the uncountable *much annoyance* refers to an experiencer-state while the countable *several annoyances* refers to the stimulus.

The nominalization of stimuli has been little discussed in comparison with, for instance, result nominalizations, but it appears that the stimulus reading is always countable regardless of what it refers to in the physical world. In the previous lexical semantic domains, it was plausible to relate the countability status of a noun to an ontological contrast based on the referent, e.g. state as opposed to event or property as opposed to a concrete instantiation of the property. In the case of stimuli, the eventual referent appears to be of little consequence to its countability status. An occurrence of *irritant* may refer to sneezing powder, which satisfies all the mereological requirements typically considered canonical for non-countable predicates, yet under the description of *irritant*, the noun is countable. The apparent reason for the discrepancy between the physical properties of the object and the countability status is that stimulus interpretations are not directly referring to the physical object as such, but rather to the physical object under its guise as an event participant. The identification of an entity as a stimulus is apparently sufficient for individuation.

Nouns which permit an experiencer-state designation, such as *despair*, always manifest an uncountable use, designating the state itself, as shown in the examples in (24). These nouns may also permit additional event-based readings, which are countable, as shown in the examples in (25).

(24) a. Nobody has the right to be in **that much despair**. (COCA)
b. The little Florian watched us with **some amusement**. (COCA)

(25) a. But I am forgetting another characteristic, a very pronounced one. That was his deep glooms, his despondencies, **his despairs**; ... (*Autobiography of Mark Twain* via Googlebooks)

b. Skip could see clearly that someday he would be quite rich. Still, he was bored most of the time. **The amusements** he pursued, the girls, fooling the teachers, thinking about his money, did not keep him energized. (COCA)

Similar wide-ranging polysemy is found with other nouns that describe emotions, including de-adjectival nouns such as *pride*. The core meaning of *pride* designates the quality of being proud, but there are extended uses, as shown in the examples below, designating an entity which evokes the quality as in (26-a), participant-anchored readings as in (26-b) which quantify over pride in different individuals, or relational readings as in (26-c), where pride is quantified in relation to different things.

(26) a. Queen knighted Bouch for his achievement - **one of the prides** of Victorian engineering. (Google)
b. Now as economists we should have **strong prides** about income in this model..., (Google)
c. A man of **small but many prides**, he regarded the accurate guessing of a bird 's weight as proof of his expertise. (Google)

Much remains to be discovered about psych-nouns, but from this short survey it is clear that the countability contrast and the patterns of polysemy are systematic. Again, the examples of this section show that a deverbal noun such as *annoyance* may have countable or non-countable uses depending on its interpretation in a context, which would be unexpected on a strictly derivational account.

4. Outlook

This paper has tried to uncover some of the distinctions that determine the countability of abstract nouns. Nouns may have multiple interpretations within a semantic domain, viz. stimuli and experiencer, but once the noun's interpretation is fixed, so is its countability. Thus, overall, the countability status of a particular noun occurrence appears due to its designation or construal in that occurrence, but this process is influenced by a complex set of factors including lexicalization patterns, ontological contrasts, and world knowledge. Additionally, it was seen that the frequent polysemy between countable and non-countable construals is at once systematic and at the same time highly dependent on the particularities of the given lexical semantic domain.

Although at first glance, abstract nouns may seem to create insoluable problems for standard formal treatments of countability, as discussed in section 1, this paper sketched how the distinctions underlying countability in the different lexical domains could be formalized either in ways congenial to the standard treatments of countability, e.g. in the case of episodic packaging, or through enriching the domain, e.g. with primitive properties. As more data is brought to bear on this issue,

no doubt these treatments will have to be extended accordingly.

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