Events and Countability

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Abstract

There is a recent view according to which countability is not derivable from the lexical meaning or denotation of singular count nouns, but rather is, in some way or another, 'added on' or 'made available', whether syntactically, semantically, or both. This view has been pursued by Borer and Rothstein among others in order to deal with classifier languages such as Chinese as well as challenges to standard views of the mass-count distinction such as object mass nouns like *furniture* and *personnel*. On the basis of a range of data, partly from German, I will argue that the grammar-based view of countability receives support also when applied to verbs with respect to their event argument position. Verbs themselves fail to specify events as countable (in English and related languages); instead countability is made available by the use of the event classifier *time* or particular lexical items, such as frequency expressions or the reifying light noun *-thing*. The paper will not develop in detail a new version of the grammar-based view of countability, though. Rather it will critically discuss the two syntax-oriented proposals by Borer and Rothstein and present two semantic options of how the view may be elaborated.

Countability is an important notion in natural language. It is the basis for the applicability of cardinal and ordinal numerals and other number-related predicates, quantifiers, or anaphora. Countability is reflected in syntactic categories or features and is most obviously associated with the category singular count nouns in languages that have a morphosyntactic mass-count distinction. There are two views of the relation of countability to the content of singular count nouns. On one view, it is an integral part of the lexical content of the noun and as such may manifests itself in the atomicity of the noun extension. On the other view, it is, in some sense, added onto the content of a noun, just as the contribution of individuating classifier appears to add countability to the content of a noun in classifier languages such as Chinese, at least on the standard view. The latter, grammar-based view of countability has been pursued by linguists such as Borer and Rothstein: Borer (2005) proposed that count DPs involve a numeral classifier as part of their syntactic structure, whereas Rothstein (2010, 2017) proposed a more complex meaning for count nouns, making mass nouns and count nouns type distinct .

In this paper I will argue that the grammar-based view of countability receives further support when applied the event argument position of verbs. Countability at least in European languages is added on to the content of verbs, rather than being derivable from it. This happens by using event classifiers or specific expressions that convey countability, such as frequency expressions, German *beides* 'both' or the light noun *–thing* when used on its count version. The choice among relative pronouns in German gives further support for verbs not being specified for countability. In this paper, I will focus on the general view of countability being separate from lexical content, without developing in detail a novel version of the view. However, I will briefly discuss the existing, syntax-oriented proposals and present two options of making the view precise semantically.

1. Verbs and countability

1.1. Choice of adverbial quantifiers

1.1.1. The light nouns *amount* and *deal* vs *number*

Across languages, simple adverbial quantifiers are generally formed with expressions that in the nominal domain apply to mass nouns, not count nouns. For count expressions to apply to the event arguments of verbs, they require the noun *time,* a generalization that holds not just for English, but crosslinguistically for corresponding nouns such as German *Mal*, French *fois*, Italian *volta*, Spanish *vez,* and Mandarin Chinese *ci* (Moltmann 1997, chap. 7.2., Doetjes 1997). Thus, amount-NPs (as I will call them) such as English *a little bit* and *a great deal* can act as bare NP adverbs, but number-NPs (as I will call them) such as *a large number* and *a couple* require the addition of *times*:

(1) a. John slept a little bit / * a couple / a couple of times.

   b. Last week, Mary worked out a great deal / * a great number / a great number of times.[1]

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[1] *A great deal* for some speakers sounds better with verbs than *a great amount*; the latter is generally fine with event nouns, though:

(i) a. ? John worked a great amount
   b. great deal / amount of work
   c. a good deal / amount of arguing

The same holds for German *eine Menge* 'a great amount / number':

c. John and Mary argued a good deal / * a great number / a great number of times.

d. John jumped a bit / * a couple / a couple of times.

e. John worked out a little bit / a great number / a great number of times this year.

A little bit, a great/good deal, can act as adverbial modifiers whether the verb describes bounded events (*jump*) or unbounded ones (*sleep, work, work out, argue*).[2] *A little bit* and *a great deal* are mass quantifiers that are NPs syntactically (Kayne 2005) and thus bare NP adverbs (Larson 1985) with *a little bit* having the structure [a [Qlittle [Nbit]]]). *A great / large number* and *a couple* are count NPs of the very same syntactic structure, but for them to act as adverbial quantifiers ranging over events requires the addition of *times*.

1.1.2. *Many, few* vs *much, little*

The choice of *little* and *much* as opposed to *few* and *many* appears to fall under the same generalization:

(2) a. John jumped too much / * too many / too many times.

　　b. John slept / worked too little / * too few / too few times.

　　c. John stumbled many / * a few / a few times times.

(ii) a. eine Menge Arbeit
　　　 a amount work
　　　 'a great amount of work'
　　b. ?? Hans hat eine Menge gearbeitet.
　　　　 John has an amount worked
　　　 'John has worked a great amount.'

[2] There are some restrictions regarding the verbs to which *much* and *little* can apply, depending on the nature and the structure of the events described. For example, *much* and *little* are rather bad with stative verbs (as opposed to adverbials like *strongly* or *well*):

(i) a. ??? Mary believes little / too much that it will rain tomorrow.
　　b.??? John knows French too much.

They are also bad when applied to verbs describing bounded events:

(ii) ??? The bird died little.

If the verb is sufficiently neutral, though, *little* can also apply when a single achievement is described:

(iii) Little happened, only the bird died.

Mass quantifiers in general require some degree of homogeneity of the domain to which they apply. The fact that there are constraints on the domain to which event mass quantifiers can apply does not go against the generalization that verbs go with mass rather than count quantifiers.

    d. John slept / worked little / * too many / too many times.

    e. John was inattentive too little / * too many / too many times.

There is a different explanation for the unacceptability of *many/few* as opposed to *little/much* as adverbial quantifiers, however. *Little/much* and *few/many* can both occur in argument position, but then display quite different readings. Both can be used anaphorically and non-anaphorically. When used non-anaphorically, *little/much* range over anything whatsoever, whereas few/many range over human beings only, a generalization that holds for other languages such as German and Italian as well:

(3) a. Little was achieved.

    b. Too much was wasted.

(4) a. Few believe that global warming isn't a problem.

    b. Many believe in god.

Few/many as bare quantifiers in argument position are not constrained to range over human beings only when used anaphorically, that is, when they relate to a previously uttered NP or a salient set of objects (deletion under identity):

(5) a. John ate too many / too few.

    b. John ate too much / too little.

(6) a. She saw many.

    b. She knows little.

Thus, (5a) and (6a) have only anaphoric readings, but not so (5b) and (6b).

    This difference can be explained in terms of Kayne's (2010) light noun theory. Light nouns can stay silent without there being an antecedent, whereas full nouns can stay silent only through deletion under identity. *Little / much* take as restriction the silent light noun THING (whose denotation is anything whatsoever), whereas *few/:many*, on a non-anaphoric use, take the light noun PERSON.[3] By contrast, when used anaphorically *many/few* come with a full noun that has been deled under identity, in the presence of an identical antecedent noun (which would of course also be the case for anaphoric uses of *little/much)*. Thus, the reason

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[3] See also also Moltmann (to appear) on the light nouns PERSON and THING.

why *few/ many* are unacceptable as adverbials is already due to the fact that they could neither take PERSON as a restriction nor be used anaphorically, taking a noun that has been deleted in the presence of an identical antecedent noun.

Note that *a large number* and *a couple* do not take the light noun PERSON. Thus we get only an anaphoric reading below:

(7) A large number believe(s) in god.

The point thus remains that count quantifiers cannot act as event quantifiers without the addition of *times*.

1.1.3. Cardinal and ordinal numerals

Cardinal and ordinal numerals behave just like count quantifiers, not being able to form adverbials without the addition of the event classifier *times*.

Bare cardinals do not form adverbials ranging over Davidsonian events, but need to combine with the classifier *time*, and that regardless of the Aktionsart of the verb, that is, even with achievements and accomplishments:[4]

(8) a. * John died only one.
    b. John died only one time / once.
(9) a. * John jumped three.
    b. John jumped three times.
(10) a. * John ran to the house four.
     b. John ran to the house four times.

However, a similar explanation applies here as with *many/few*. Like the latter, cardinal numerals as bare quantifiers display an anaphoric reading as bare quantifiers, though unlike *few/many*, cardinal numerals do not permit a non-anaphoric reading. Thus (11) cannot mean that John saw one person (i.e. saw 'someone') or that John saw one thing (saw 'something'):

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[4] *Once* and *twice* obviously are morphological composites, composed of a number root *on-* and *tw-* and morpheme *–ce*. *Once* and *twice* have been analysed by Kayne (2015) as containing silent *time*, as *on-time-ce* and *tw-time-ce*. Kayne argues that the morpheme *–ce* is a preposition 'at' and silent *time*, which, Kayne argues, is singular even with *tw*, a numeral classifier. Note that other languages use instead of morphologically complex *once* and *twice* syntactically complex adverbials (French *une fois, deux fois*, Italian *una volta, due volte* etc).

(11) John saw three.

In any case, the reason for the unacceptability of (8a, 9a, 10a) is already the impossibility for cardinals taking a light noun in order to function as bare NP adverbs.

   Ordinals, however, do make a case for the requirement of acountability specification for verbs with respect to the event argument position. Unlike cardinals, *first, second*, *third* etc. *can* act as adverbials, in particular in sentence-initial position when ranking the proposition asserted in a list of others (*Third, John stumbled*). But ordinal numerals cannot act as adverbials ranking the described event in a list of events of the same type. For that, they need to combine with *time(s)*:[5]

(12) a. ??? Mary stumbled third(ly).
      b. Mary stumbled a third time.
(13) a. ??? John married second(ly).
      b. John married a second time.

The reason for the inability of ordinals to act as adverbials without the event classifier *time* thus appears to be due to verbs not specifying Davidsonian events as countable.

1.2. The event classifier *times*

By specifying countability and thus making count quantifier and numerals applicable, *time* has the semantic function of a numeral classifier, as has been noted in the literature (Doetjes 1997, Landman 2006, Tovena 2012).[6] *Times* ensures the countability of event units on the

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[5] In English, ordinals can occur adverbially ranking an even participant with respect to other individuals playing the same thematic role with respect to the same type of event:

(i) a. John entered first.
    b. Mary died third.

However, here *first* and *third* act as subject-oriented secondary predicates, not as event predicates, just like *fully dressed* and *poor* below:

(ii) a. John entered fully dressed.
     b. Mary died poor.

[6] *Time(s)* also exhibits syntactic properties characteristic of individuating classifiers, such as not allowing adjectival modifiers (Cheng/Sybesma 1999):

basis of various conditions holding of the events (in the context). They are illustrated in the examples below:

(14) a. John fell three times.

    b. John slept three times today.

    c. Mary worked out three times this week.

    d. John owned the painting three times in his life.

    e. John was attentive three times.

Times picks out event units on the basis of one of three conditions obtaining:

[1] having a boundary (or being an atom with respect to the verbal event concept), as in (14a)

[2] being maximally continuous in time, as in (14b, c, d)

[3] occurring at contextually given occasions, as in 14e).[7]

Time(s) fails to apply when no such individuating conditions obtain, for example, under ordinary circumstances, below:

(15) ?? John knew Bill a few times.

The countability made available by *-times* thus does not come for free, but needs to be grounded in conditions that come with the events being described.

    By requiring a numeral classifier for the application of count quantifier or numerals, verbs (with respect to their event argument position) pattern just like nouns in languages such as

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(i) a. ??? John stumbled three unusual times.
    b. ??? We met three beautiful times.

[7] There are also event classifiers that only pick out natural units in a structured event, rather than imposing a condition on temporal separation, for example Mandarin Chinese 'turn'-type classifiers, as in (ia, b), which contrast with 'time'-type classifiers, as in (ic) (Huang /Ahrens 2003):

(i) a. (dale) play-ASP san three tang CL taijiquan Tai-Chi yihou after ta s/he shenti body
    shufu comfortable duo more le LE
    'S/he feels much better after performing three rounds of Tai Chi.'
    b. dale play-ASP san three bian CL taijiquan Tai-Chi yihou after ta s/he shenti body
    shufu comfortable duo more le LE
    'S/he feels much better after performing three rounds of Tai Chi.'
    c. dale play-ASP san three ci CL taijiquan Tai-Chi yihou after ta s/he shenti body
    comfortable duo more le LE
    'S/he feels much better after performing three times Tai Chi.'

(ia) with *tang* and (ib) with *bian* are reported to better than (ic) with the time-based classifier *ci*.

Chinese (on the common view).[8] In Chinese, likewise, natural units in the denotation of nouns influence the choice of individuating classifiers (Cheng / Sybesma 1999).

1.3. Frequency adverbials as unity-introducing expressions

Frequency adverbials may seem to pose a challenge to the generalization that count quantifiers do not apply to Davidsonian events directly. Frequency adverbials appear to be count quantifiers able to modify verbs without the presence of *time(s):*

(16) a. John stumbled frequently.
     b. John worked out frequently.
     c. John was frequently inattentive.

However, frequency adverbials do not presuppose countability, but rather make it available, just like *times*. That is because the adjective *frequent*, from which *frequently* is derived, can modify event mass nouns as in (17a, b) and not just event plural nouns as in (17c), as noted in Moltmann (1997, Chap. 5.1., p. 142ff):

(17) a. the frequent rain
     b. the frequent fog in this region
     c. the frequent rainfalls

Frequent(ly) introduces countability on the basis of the same conditions as the unity-introducing classifier *times*: inherent boundedness of events (16a), maximal continuity (16b), and connectedness to occasions (16c). Semantically, *frequent* thus decomposes into what is conveyed by *times* and a count quantifier (roughly 'many times').

     Frequently is not the only apparent count quantifier able to apply to mass categories. Thus, Moltmann 1997, Chap. 5, 156ff) pointes out that in German, *vieles* 'many' and *manches* 'some' are quantifiers that are syntactically mass (being singular and requiring singular verb agreement), but that *vieles* has the meaning of 'many' and *manches*, roughly, that of 'few', both counting well-distinguished units and contrasting with *viel* 'much' and *etwas* 'some'

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[8] Cinque (2006) argues that temporal measure words such *years* and *days* also act as numeral classifiers in English.

respectively. This manifests itself in that predicates like *distinguish,* which require discrete units on the internal reading, are possible with the former, but not the latter:

(18) a. Anna konnte vieles / manches Holz nicht unterscheiden.

    Ann could many / some wood not distinguish

   'Anna was unable to distinguish many / some pieces / sorts of wood.'

    b. ??? Ann konnte viel / etwas Holz nicht unterscheiden viel.

    Ann could much / some wood not distinguish

   'Ann was unable to distinguish much / some of the pieces / sorts of wood.'

The units may be distinguished contextually or in virtue of the nature of the substance. For example, *vieles* and *manches* in (18a) count either units of wood that are well-distinguished from each other in the context or else different types of wood; by contrast, *viel* and *etwas* in (18b) only have a measurement reading. *Vieles* and *manches* thus are a mass quantifiers which presupposes the contextually given discreteness of the domain they apply to and make predicates like *distinguish* (on the internal reading) available. Though *vieles* and *manches* do not apply as adverbials to events, they illustrate the possibility for a quantifier to make countabilty available by way of its lexical meaning.

2. The German quantifier *beides*

Like frequency expressions, German quantifier *beides* 'both' is an expression that introduces countability lexically, and as such applies to Davidsonian events. It is syntactically singular, requiring singular agreement of the verb:

(19) Beides ist / * sind unmoeglich.

   both is / are impossible

   'Both is / are impossible.'

Beides is a quantificational expression that occurs both as an anaphor in argument position and as a floated quantifier. *Beides* can anaphorically and as a floated quantifier relate only to a mass DP, as in (20a), not a count DP, such as the colletive DP in (20b):

(20) a. Hans trank den Wasser und das Bier. Er hat beides schnell getrunken.

John drank the water and the beer. He has both quickly drunk

'John drank the wine and the beer. He drank both quickly'.

   b. Hans traf Anna und Bob / ein Ehepaar. * Beides ist / sind Amerikaner.

John met Ann and Bob / a couple. both is / are American

'John met Ann and Bob / a couple. Both are Americans.'

The mass NP that *beides* relates to needs to stand for two descriptively distinguished subquantities:

(21) a. Das Gold und das Silber kostet beides zu viel.

    the gold and the silver cost both too much

    'The gold and the silver cost both too much.'

  b. Hans kaufte Wasser und Bier. Das war beides sehr billig.

    John bought water and beer. it was both very cheap

    'John bought water and beer. They were both very cheap.'

  c. Der Schmuck in den zwei Schachteln kostet beides 100$.

    the jewelry in the two boxes costs both 100$

    'The jewelry in the two boxes is both 100$.'

Beides generally triggers a distributive interpretation of the predicate, as in (21a, b). *Beides*, moreover, makes number-related predicates applicable to mass NPs, that is, predicates that ordinarily cannot apply to mass NPs, such as *count, list*, and *enumerate*:[9]

(22) Das Wasser und das Salz, Hans hat das beides / *das mitgezaehlt / mitaufgelisted.

   The water and the salt, John has that both / that counted / listed

   'The water and the salt, John has that both / that counted / listed too.'

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[9] Plural anaphora in German, by contrast, won't permit a conjunction of mass NPs as antecedent:

(i) a. Hans trank das Wasser und das Bier. Er trank es (beides) / ?? sie schnell.
   'John drank the wine and the beer. He drank it both / them quickly.'
  b. Hans kaufte Reis und Salad. (Das) beides / ?? Sie brauchte er fuers Mittagessen.
   John bought rice and salad. that both / them needed he for lunch
   'John bought fruit and salad. He needed both / them for lunch.'

That is because plural anaphora require a plural antecedent syntactically (Moltmann to appear).

Beides thus introduces countability by way of its lexical meaning, similarly to *frequent(ly)*, *vieles* and *manches*. What is important in the present context is that *beides* can relate to Davidsonian events introduced by a conjunction of VPs, either as a floated quantifier of the mass pronoun *das*, as in (23a, b), or just anaphorically, as in (23c):

(23) a. Es blitzte und donnerte. Das hat beides nicht lange gedauert.

      It lightened and thundered. It has both not long lasted

    'There was lightning and thunder. Both did not last long.'

   b. Hans schrieb einen Brief und unterzeichnete ihn. Er hat das beides gestern gemacht.

    John wrote a letter and signed it. He has that both yesterday made

    'John wrote a letter and signed it. He did both yesterday.'

   c. Maria tanzte und malte. Beides hatte sie gerade gelernt.

    Mary danced and painted. Both had she just learned

    'Mary danced and painted. She had just learned both.'

The ability of *das beides* to relate to Davidsonian events again shows that that verbs do not convey countability, but permit the application of expressions that do, making available a plurality of two distinct entities based on the complex event description.[10]

4. The light noun *–thing*

NPs with the light noun –thing (as in *something, everything, nothing*) appear to present counterexamples to the generalization that number-related expressions cannot directly apply to verbs with respect to their event argument position:

(24) a. John did two things: read a book and take a walk.

   b. John continued two things: reading and talking.

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[10] *Beides* differs from plural anaphora, which cannot take conjoined verb or VPs as antecedents, including in English (Geis 1975):

(i) ??? Hans oeffnete die Tuer und schloss das Fenster. Er tat sie vor einer Stunde.
   'John opened the door and closed the window. He did them an hour ago.'

Sie and *they* seems to require nominal antecedents, unlike *beides* or *both*.

In (24a, b), *two things* appears to range over the event denotations of VPs, with *thing* acting as a noun standing for anything whatsoever, including Davidsonian events. However, as a count noun, *thing* appears to be like a numeral classifier in that it can apply to a mass domain, mapping it onto a countable one (Moltmann, to appear):

(25) a. Mary forgot one thing, the medicine.

b. There is one thing Mary did not eat, the brown rice.

Thing in general appears to have a reifying force, which allows it to map entities that do not count as single entities onto those that do (Moltmann 2016, to appear);.

5. Selection of relative pronouns in German

The prediction that verbs classify as mass when they have to be classified for the syntactic mass-count distinction is also supported by the choice of relative pronouns. German has two kinds of relative pronouns: w-pronouns (*was*, *wo*) and d-pronouns (*der, die, das*). The generalization is that light mass NPs (with the silent light noun THING) select w-pronouns, whereas light count NPs (with the silent count noun PERSON) select d-pronouns (Moltmann, to appear):

(26) a. alles / nichts / etwas / das, was / wovon / * das / * von dem

all / nothing / something that / what / of where / that / of that

b. jeder, der / von dem / * was / * wovon

'everyone who / of whom / what / of where

The observation then is that verbs always select w-pronouns rather than d-pronouns, regardless of their Aktionsart:

(27) a. Hans lachte / fiel, was / * das er selten tut.

John laughed / fell, what / that he rarely does

'John laughed / fell, which he does rarely'.

b. Maria tanzte und sang, was / * das sie beides lange nicht mehr getan hatte.[11]

   Mary danced and sang what / that she both long not more done had

   'Mary danced and sang, which she both had not done for a long time.'

c. Maria tanzte und sang, worauf / auf das jeder gehofft hatte.

   Mary danced and sang where of / of that everyone hoped

   'Mary danced and sang, which everyone hoped for.'

This is a further indication that verbs regardless of their lexical content and semantic environment fail to be marked for countability.

6. Event nouns and pluractionality

While verbs do not specify events as countable, event nouns do, as long as they are count nouns syntactically. Given the grammar-based approach to countability, this means that deverbal nominalizations that are count nouns do more than just pick up an event argument of a verb: they are unity-introducing like all count nouns. But with countability markers in general, the choice of mass or count for a deverbal nominalization is not arbitrary, but generally depends on how events are individuated, involving distinctions such as that between achievements / accomplishments and activities / states (Barner/Wagner/Snedeker 2008). Mass event nominalizations generally are based on activity verbs (*laughter, rain, sleep*), whereas count event nominalizations are based on achievement or accomplishment verbs (*jump, crossing, death*) or event-individuating conditions such as maximal temporal connectedness (*walk, speech, workout*).

   Pluractionality is an apparent marking of event plurality on verbs, which can be found, for example, in some Native American languages (Hendersen 2019, Cabredo-Hofherr 2021). Pluractionality might suggest that verbs in the relevant languages display a morphosyntactic mass-count distinction, with verbs marked for pluractionality being on a par with plural count nouns with respect their event argument position. This would be perfectly compatible with the view of grammar-based countability, since countability may in principle be conveyed by other categories than nouns. However, this does not seem to be what the research on pluractionality actually shows. According to Doetjes (2008), pluractionality consists less in the marking of countability, but of a general 'increase' of eventuality, not distinguishing between amount and

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[11] Note in (27b) the floated mass quantifier *beides.*

number. If that is correct, then countability would in fact be reserved for nouns, as Doetjes suggests.

7. Making sense of the grammar-based approach to unity

Given the generalizations in the preceding sections, verbs (in languages like English and German) are on a par with nouns in classifier languages like Chinese (given the standard view).[12] More precisely, verbs (in the languages in question) fail to specify events for countability: for Davidsonian events to allow for the application of number-related expressions requires the use of a classifier, a count category, or a particular lexical expression making countability available - though generally on the basis of unifying conditions, such as boundedness, maximal temporal continuity or connectedness to individuals or occasions. This matches the more general view of grammar-based countability, which involves what Rothstein (2017) calls 'grammaticized individuation', as opposed to the individuation of entities in (language-independent) cognition and to the real structure of things. Whereas unity in cognition generally can be read off unifying conditions (conditions of integrity) of one sort or another, this is not so for the level of 'grammaticized individuation', where unity and the lack of it is not always derivable from actual or perceived unifying properties of entities or from mereological properties of the extension of the expression used to refer to it (atomicity).[13] This matches findings in cognitive science: the cognitive division of entities into objects and stuff has been shown to precede the acquisition of language and is independent of the mass-count distinction as such (Chierchia 2015).[14] Note also that count nouns like *quantity* and *portion* may specify their referents as single entities without there being any substantive unity (in particular on a legitimate, philosophers' use of language) (McKay 2016), as does the use of *entity* in this paper.

The question is how to make sense of that. If an entity is conceived as a single thing or if that entity is in fact a single thing, how can the use of language make a difference as to

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[12] Bale and Gillon (2021) show that there are some quantifiers in Chinese that do not require classifiers. But this may just mean that countability may be specified lexically, as with frequency adverbials and German *beides*.

[13] Rothstein's (2017) motivations for the view were mainly object mass nouns such as *furniture, hardware, personnel* as well as classifier languages such as Chinese.

[14] The individuation of entities in cognition may still matter for the distributive application of predicates of size and shape to mass nouns (*large furniture, round hardware*) as well as for mass quantifiers like *little*, *much* or *more* which with verbs like *jump* may still 'measure' by counting 'atomic' events (Wellwood/Hacquard/Pancheva 2012, Barner/Snedeker 2005).

whether the thing counts as a single thing for the purpose of the application of number-related expressions? Let me just go through the options in most general terms, focusing on their applicability to Davidsonian event arguments of verbs.

First, there is a syntactic account of grammar-based countability, namely Borer's (2015) theory of the mass-count distinction. On that theory, count DPs have a different syntactic structure than mass DPs, namely the very same structure as classifier DPs containing a classifier phrase. In English, that phrase is headed by a silent feature IND, which is spelled out as the deterliner *a* or else plural morphology. Given that account, implicit event arguments of verbs should likewise require a classifier phrase, which now would be part of adverbials and be headed by *time(s)*.

Another proposal is Rothstein's (2010, 2017) type-theoretic account, which assigns count NPs and mass NPs different semantic types. The idea is that count nouns involve a relativization to a contextually given set of entities, which serves to ensure that the referents the count noun be atoms with respect to that set (which allows referents of nouns like *sequence* to be atomic in a context even if they have proper parts that fall under the same noun) .

One problem with both Borer's and Rothstein's theory is to account for the possibility of countability being conveyed by particular lexical expressions such as frequency expressions. While Borer's theory would require decomposing such expressions in syntax, positing a classifier phrase for them; for Rothstein they will be a problem as long as types are taken to be associated with syntactic categories, not individual lexical expressions.

Another difficulty for both theories is to allow for countability playing a role for semantic (rather than syntactic) selection. Rothstein in fact takes the restriction of numerals to count nouns to be due to a selection of types: numerals select nouns of the type of count nouns, rather than mass nouns. One might argue that given the grammar-based view, countability should not be dealt with semantically, but only syntactically, in terms of syntactic selection or agreement of syntactic features. But this cannot be right. First, predicates like count *list* and *enumerate* select count DPs in virtue of their meaning, not just their syntax, as do predicates like *is one of the* NP or *is among the* NP. Second, sentences like *That entity is a single thing* (a legitimate, even if philosophical, use of language) should be true or false as a matter of the denotation of *that entity* and *is a single thing*, not as a matter of agreement between *single* and the count feature of *that entity*, which is entirely implausible.

There is also an issue whether the notion of atomicity (with respect to a context) really captures the notion of being a single thing (since there is nothing wrong with a single thing

having a proper part of the same sort that is also a single thing). In fact, it is not at all clear how the notion of being a single thing (unity) is to be understood if it does not require substantive unifying conditions (as is the case *quantity* and *entity*). The question of unity as such, including the question of what distinguishes the many from the one, has been an issue of debate since antiquity (Priest 2015) and one may question whether linguists should take on the task of defining it. In the present context, therefore, let us set this issue aside and simply make use of a feature U, the property of being a single entity. There are then two options of how to make sense of grammar-based countability semantically.

One of them, pursued in Moltmann (2021) is based on a particular, plenitudinous ontological view. This is the view that ontology is very rich in spatio-temporally coincident entities, and in particular for any entity that is a single entity there is also one minimally different from it by not being a single entity (but what one would refer to with a non-count expression). In that ontology, what is described as 'the loaf of bread' and 'the (same) bread' would be different entities, as would be 'that portion of rice' or 'that quantity of rise' and 'that (same) rice', and an event described by a verb and an event described *time* + verb or a count event nominalization. Given such a view, using a count noun, classifier, or lexical item conveying unity means selecting a unified whole, rather than its non-single correlate.

A less ontologically involving option is to make a particular use of situations, namely on which situations keep exactly track of the information about an entity, particular, regarding whether an entity has the feature U or not. On such an approach the use of DPs will be relativized to a reference situation type representing a referent either as having U or not, depending on whether the DP involves a classifier, a singular count noun or specific lexical expressions conveying countability. I will just give a semiformal sketch of how the meaning of the event classifier *time* and of *beides* may look on such an approach, leaving the development of a formal, compositional semantics for another occasion.

(Singular) *time* would denote a unit-introducing function, mapping a pair of an event e and a situation type S, to a pair <e, S'>, such that e has U in S':

(28) The semantics of the event classifier *time*

    For an event e and a situation type S,

    $[time](e, S) = <e, S'>$, where $S' = \{s' \mid \exists s \in S, s < s' \ \& \ s' \models U(e)\}$, if *e* is bounded, maximally continuous or connected to an occasion in the situations in S; undefined otherwise.

Here situation types are taken to be sets of situations, $<$ is a (reflexive) part-of relation among situations, and $\models$ is the relation of exact truthmaking of Fine (2017), which captures the relation of a situation representing exactly the content of a sentence (that is, s $\models$ F just in case s makes F true and is wholly relevant for the truth of F, for a formula F). Thus, *time* involves shifting situations s to larger situations s' in which the event e has the feature U (that is, is a single entity). Similarly, *beides* can be assigned a situation-shifting meaning of the sort below:

(29) The semantics of the German mass pronoun *beides* 'both'

For an entity e and a situation type S,

$[beides](e, S) = <e, \{s' \mid \exists s \in S, s < s' \ \& \ s' \models U(e_1) \ \& \ U(e_2)$, for distinct entities e_1

and e_2 such that $e = e_1 \oplus e_2$ and e_1, e_2 have a boundary or are maximally connected

in the situations in S}

Here $\oplus$ is the operation of sum formation, mapping an entity to their sum. The part relation $<$ is taken to be reflexive since e_1 and e_2 may already have U in the situations in S.

8. Other categories or uses of categories lacking a mass-count distinction

Not only verbs, but also other non-nominal categories fail to display countability regardless of the nature of their denotations. One such category is clauses.[15] Verbs taking clausal complements take amount-NPs, but not number-NPs, though they accept –*thing*-NPs (even in the plural):

(32) a. John assumes that he will succeed and become famous.

b. John assumes a great deal / amount.

c. ?? John assumes a great number / a couple.

d. John assumes many things.

Clauses in German also choose w-pronouns, not d-pronouns:

(33) Hans glaubt, dass es regnen wird, was / * das Mary auch glaubt.

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[15] It has been argued that clauses sometimes are headed by a DP node (Kastner 2015), but this does not entail countability marking.

'John believes that it will rain, which Mary believes too.

Similar observations can be made for adjectives in predicate position and NPs that are used non-referentially (intensional NPs and pure quotations), and that even if the entities they stand for appear to form a countable domain of propositions, properties, or expression types. This again supports the generalization that countability for the purpose of the application of number-related expressions requires an explicit specification of countability and does not come for free.

9. Summary and final remark

This paper has given support for the grammar-based approach of countability, on which the semantically relevant notion of unity (or of being a single entity) is tied to the use of count categories as well as of expressions that act as numeral classifiers or convey countability lexically (such as frequency expressions and German *beides*, *vieles*, and *manches*). The paper has also presented two ways in which the notion of grammar-based countability can be understood semantically.

Note that the view that verbs do not specify events as countable does not put into question the parallelisms between count and mass nouns and telic and atelic (or non-homogeneous and homogenous) event predicates that have been drawn in the literature, that is, parallelisms according to which *run to the house, eat an apple* and *drink the wine* are telic and side with count nouns, and *run, run toward the house*, and *drink wine* are atelic and side with mass nouns. (Vendler 1957, Mourelatos 1978, Verkuyl 1972, Bach 1986, Dowty 1979, Krifka 1998, Champollion 2017). Those parallelisms, which also play a role in cognition (Wellwood, A., V. Hacquard, and R. Pancheva 2012), concern properties of extensions such as atomicity, cumulativity, and homogeneity. Such properties are generally taken to play a role for the choice of adverbials such as *in an hour* and *for an hour* as well as other semantic phenomena. When Bach (1986) proposed that the verbal domain of events divide into a mass and a count domain parallel to that of the nominal domain, the criteria were not so much countability (applicability of number-related expressions), but rather extension-based properties of complex event predicates.

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