SCOTT GRIMM
University of Rochester, USA

Crime INVESTIGATIONS: THE COUNTABILITY PROFILE OF A DELINQUENT NOUN

ABSTRACT: This paper aims to broaden our understanding of countability beyond what is found with concrete nouns, providing a one-word case study of the countable and non-countable uses of the noun *crime*. I show that the behavior of *crime* runs counter to a variety of expectations inherited from the literature on countability: its countable use cannot be directly grounded in atomic acts or events, nor is its non-countable use simply equivalent to a plural individual composed of individual crimes, as one might expect on analogy with certain analyses of *furniture*. Additionally, while *crime* has a use as a bare plural, that use does not refer to a kind. A quantitative study supports these conclusions. Altogether, *crime* demonstrates a novel noun type with respect to its nominal semantics and countability behavior, which is also an indication of the large empirical terrain that awaits exploration for eventive and abstract nouns.

1.   INTRODUCTION

This paper has the modest goal of investigating the countability of one word, *crime*, and examining its implications for our general understanding of countability.[1] The interest of this noun and similar nouns is clear.

The bulk of the countability literature following Link (1983) has focused on mereological properties, such as atomicity or cumulativity, related to nouns designating concrete objects, such as *dog* or *tree*. As will be shown, the word *crime* presents difficulties for both theories of countable nouns and non-countable nouns since its countability behavior is not determined in the same way by mereological properties nor by other properties familiar from the countability literature. If the source of countability contrasts for more abstract or eventive nouns such as *crime* is different from mereological properties, then a more general account of countability is needed, regardless of how important mereological properties may be for concrete nouns. In some sense, this paper is a companion piece to Grimm (2014) which examined several domains of abstract nouns, showing that the terrain is more difficult than the classical picture predicts.[2]

The paper is organized as follows. Section 2 examines both countable and non-countable uses of *crime*, using a range of diagnostics from the literature. I first argue that the behavior of countable *crime* is far more intricate than one might anticipate, and further cannot be determined based on properties of individual crime acts or events. I then compare non-countable *crime* with other non-countable noun types, such as substance nouns (*water*) or artifactual aggregates (*furniture*), showing that non-countable *crime* differs: it designates (sets of) individual criminal acts, but these are not grammatically accessible. I further distinguish kind-referring uses of *crime*, showing that while there is a bare plural usage of *crime*, it does not refer to a kind as one would expect, rather this responsibility is taken up by the bare singular use. Section 3 presents a quantitative study to assess the distributional characteristics of canonical countable and non-countable nouns and to assess *crime*'s position relative to these nouns, ultimately providing support for the distinctions made in section 2. Section 4 provides a conclusion and directions for future work.

2.   DIAGNOSING *CRIME*

Crime, like many nouns, manifests a non-countable and countable use, shown in (1).

(1)   a.   Ed prosecuted many crimes.   (countable)
       b.   The mayor worried about crime.   (non-countable)

Theories of countability make relatively clear predictions of where the difference between these two uses should lie. The use of *crime* in (1-a) should refer to a plurality of individual crime entities, presumably events, which satisfy whatever property is asserted to correspond to carving out individuals from the flux of the world, e.g. atomicity. In contrast, the use of *crime* in (1-b) should reference entities which manifest properties such as divisiveness or cumulativity. Neither of these suppositions is straightforwardly fulfilled, it turns out, although there will be partial connections. I first examine the behavior of countable *crime* and then turn to non-countable *crime*.

2.1. Countable *Crime*

A person is robbed on three particular occasions: this can be described as three crimes, where the distinct events are what is counted, as in (2). That much is intuitively clear.

(2)   Three crimes took place on 145th St.

The performance of countable uses of *crime* with the standard mereological diagnostics, however, is mixed. Here I am assuming the standard second-order mereological properties widely assumed following the work of Quine (1960), Cheng (1973), and Link (1983), namely ATOMICITY, CUMULATIVITY and DIVISIBILITY, given in (3), (4) and (5), respectively.

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

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

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

The countable use of *crime*, as expected, is clearly neither generally cumulative, as witnessed in (6), nor is it divisive, since there is no guarantee that a crime may be subdivided into smaller crimes.

(6)   There was a crime in the parking lot.
           There was a crime in the alley.
           $\nRightarrow$ There was a crime in the parking lot and in the alley.

Yet, contrary to expectations, it is not clear that *crime* qualifies as atomic, since an event which is considered to be a crime may indeed contain an event which is yet again a crime, e.g. an event of robbery may contain a sub-event of breaking and entering, both of which would qualify as crimes.

Countable *crime* offers up a host of difficulties for a semantic analysis. First, even identifying whether an act[3] qualifies as a crime can be a difficult matter in itself, for determining if an act qualifies as a *crime* is dependent on how that act is judged within a societal and/or legal context. This situation is unlike, say, that of natural kind nouns such as *water*, where one looks to the entity itself to determine whether a substance qualifies as *water*, or for an act of *walking*, where one can examine the act itself to determine if it qualifies as an instance of walking (were the legs moving?, etc.). This can be clearly seen in that whether an act qualifies as a crime can change from era to era[4], yet whether an act qualifies as *walking* presumably does not change. Thus, no act is inherently a crime, but *crime* serves as a classification over acts—naming those which, through social stipulation, are taken to be punishable.

This indeterminacy concerning which acts qualify as *crime* bleeds over into how crimes are counted. Moreover, how to count crimes is not merely a theoretical issue, but one of consequence in the legal field that has occupied the US Supreme Court, among others. Chemerinsky (2009) discusses a wide range of legal cases where the mapping between the number of acts or (pre-theoretic) events and the number of independent crimes are at odds. In one case, *Hennemeyer v. Commonwealth*, a man had two altercations with the police on two consecutive days. On the first day he fired a gun four times within the space of a few minutes, and on the second day he fired a gun six times at the police in lengthier intervals. The court ruled that the first four shots were a single crime, considered a "single course of action" while the subsequent six shots were "each considered discrete crimes" (Chemerinsky 2009, p. 726). Thus while criteria which determine the number of gun firing acts are reasonably clear cut, they do not match the number of crimes as determined by the court. The conclusion appears to be

that efforts to anchor counting *crimes* on properties of the events which *crime* describes, here shootings, will suffer fatal setbacks. Difficulties arise for counting crimes in the other direction as well: a single act can be considered as two or more crimes. Crain (1959) discusses several such cases where a single act had multiple effects, and therefore were treated as multiple and distinct crimes. For instance, in one case a man "wounded two officers with one blast from a shotgun. He was convicted for two assaults and given a ten-year sentence for each..." (p. 869) In this case, since there are two effects there are two crimes. Alternately, a single act may violate two separate laws or statutes, and thereby constitutes two separate crimes. As discussed on a variety of legal websites[5], cases of drunk driving often involve charges of two distinct crimes related to one act of driving: driving under the influence while intoxicated and driving with a blood-alcohol content level of 0.08% or higher. Other examples of one act counted as two crimes include "a defendant who allegedly had sex with someone after the person had passed out from drinking too much alcohol. The defendant was convicted of rape of an unconscious person under California Penal Code Section 261(a)(4) and rape of an intoxicated person under California Penal Code Section 261(a)(3)."

This situation is very different than usually obtains for the entities or events discussed in the countability literature, where determining multiple instances of an entity or event relies upon those multiple instances being spatially or temporally distinct. For instance, in previous work, where I had limited myself to natural concrete entities, I required countable nouns to refer to entities which were topologically separated (Grimm 2012), and others have posed similar conditions, such as Rothstein's (2010) requirement that entities be (contextually) non-overlapping or Landman's (This Volume) requirement of (contextual) disjointness. This would not seem to apply to the cases just discussed: For the drunk driver charged with two crimes, there are no separate or disjoint acts or events to point to which would correspond to "driving under the influence while intoxicated" and "driving with a blood-alcohol content level of 0.08% or higher", to the contrary, they often may be completely co-extensional.

The upshot of this discussion is that for countable uses of *crime*, it is not the act or event in itself which provides criteria for individuation of *crime*, but external judgments about the content of the act or event. One act can count as multiple violations, and multiple acts can count as only one violation. Further, the context can change, i.e. in the case of a different judge who has a different interpretation of the law, resulting in greater or fewer crimes, without having greater or fewer discrete acts. Part of the issue is likely that *crime* does not provide a description of a particular type of event, in the way that, say, *robbery* does; but rather serves as a classification over acts in terms of whether they violate laws. In sum, the behavior of countable *crime* flies in the face of the main trend in the countability literature to derive countability classes from the mereological, spatial or temporal properties of entities or events. Instead, what is critical for counting crimes is how the act or acts relate to the laws.

2.2.   *Non-Countable Crime*

While the intuitions of what is counted by countable uses of *crime* are challenging, the intuitions of precisely what the bare singular use of *crime* refers to are yet murkier. I will first contrast the semantic and distributional behavior of *crime* with what is known about other relevant noun types: substance nouns and aggregate nouns, for the latter, artifactual aggregate nouns like *furniture* and collective aggregate nouns like *foliage* are canonical examples. I will then go on to examine the relation between the different forms of *crime* and their propensity to support kind/generic readings. I will suggest that non-countable *crime* does not make individual crime events accessible, instead designating non-particularized reference, which contrasts on the one hand with countable *crime*, which makes reference to particular acts/events, and on the other hand with kind-reference achieved through uses of the bare singular.

2.2.1.   Non-Countable *Crime* as Analogous to Non-Countable Substance Nouns

Although it is intuitively clear that the non-countable use of *crime* differs from the more familiar non-countable nouns of substance (*water, gold, oil*), it is useful examining to what extent the characterizing properties hold for *crime*. Cumulativity clearly holds for non-countable *crime*, as

shown in (7).

(7)   There was crime in the parking lot.
          There was crime in the alley.
          ⇒ There was crime in the parking lot and in the alley.

Yet, as is well known, satisfying cumulativity does not distinguish be-
tween terms with "mass" reference and terms with plural reference.

   Turning to divisiveness, which potentially could distinguish mass
from plural reference, it is very difficult, in general, to use the diagnostic
with *crime*, as seen by considering the use of a substance noun *water* in
(8). Intuitively considering the portion of water asserted to be on the
table, one would conclude that any smaller entity contained within the
water also qualified as *water*. The use of *crime* in (9) differs: it is not
obvious exactly what event is asserted, and due to this vagueness, it is
less than clear how to examine sub-events and determine if they qualify
as *crime* as well.

(8)   There is water on this table.

(9)   There is crime on this street.

Further, it seems intuitively clear that, whatever *crime* refers to, it bot-
toms out at individual criminal acts or events, rather than any sort of
crime "stuff". I conclude given the above that non-countable *crime* can-
not be forced into denoting some sort of "abstract stuff" or other sub-
stance interpretation, but must indeed refer to individuals of some sort.

2.2.2. Non-Countable *Crime* as an Aggregate Noun

If individuals are critical to the designation of *crime*, the subsequent
question is whether the type of reference associated with bare singu-
lar *crime* resembles various aggregate nouns discussed in the litera-
ture, such as what I term artifactual aggregates, e.g. the bare singu-
lar noun *furniture* which has received substantial attention (see Chier-
chia 1998b; Barner & Snedeker 2005; Deal To appear among others)
or collective aggregate nouns such as *foliage* (see Grimm 2012 for dis-
cussion). I will consider the two types of nouns in turn.

   Despite the obvious difference that artifactual aggregates, such as
furniture, achieve references to concrete objects in the world, e.g. chairs

and the like which serve as furniture, while *crime* references events,
each of which itself can be described as *a crime*, an analogue could be
found between concrete objects which are found in the denotation of
furniture and events which are found in the denotation of *crime*. On
this view, could not *crime* itself be the sum of all crimes, as Chierchia
(1998b) has suggested for *furniture*?

   Several further shared characteristics strengthen the potential par-
allel. *Furniture* references objects which have distinct names, e.g. *chair*
or *table*, as *crime* analogously does, referencing acts which often have
distinct names, such *robbery* or *theft*. Also like *furniture*, uses of non-
countable *crime* can be shown to include singularities, here of events,
as shown in (10).

(10)   a. There was furniture in this room.
              ⇒ can be true when there was just one piece of furniture
          b. There has been crime on this street.
              ⇒ can be true when there was just one crime

   Accordingly, there is a case to be made that just as the denotation
of *furniture* is often analyzed as constituted by pluralities of pieces of
furniture (Chierchia 1998b; Bale & Barner 2009), *crime* could be an-
alyzed as constituted by pluralities of individual crimes. I will argue
that a range of data shows that this is not feasible, since non-countable
crime and plural *crimes* have distinct meanings, although clearly there
is some relation between the denotation of the bare singular *crime* and
the denotation of countable *crime* that must be accounted for.

   One of the striking characteristics of *furniture* is the accessibility of
individual pieces, and here *furniture* contrasts starkly with *crime*. I will
present several diagnostics showing how this differs for non-countable
crime, for which individuals are *not* accessible.

   That the individual pieces of *furniture* are accessible has been shown
by *furniture*'s ability to combine with various grammatical elements that
impose a distributive reading. As pointed out by Schwarzschild (2011),
when *furniture* is modified by *big*, or other "stubbornly distributive"
modifiers such as *circular*, the only reading available is one in which
the pieces are big, as opposed to the reading where the collection of
furniture is large.[6]

(11)   a.   big furniture ⇒ ✓pieces are big, ✗collection is big
        b.   circular furniture ⇒ ✓pieces are circular, ✗collection is
              circular

This behavior does not find a parallel with *crime*, as the accessibility of individual *crime* events appears to be lacking. While this cannot be detected using "stubbornly distributive" adjectives such as *circular* or *big*[7], since those adjectives do not apply well to eventive nouns, through using other adjectives one can observed distibutional and meaning contrasts in this domain. Adjectives designating emotional responses, such as *abominable, appalling, horrible*, or *sickening,* show a distributional asymmetry in the large corpus to be discussed in section 3: they are abundantly present with bare plurals and other countable uses, but never found with non-countable uses. This contrast can also be seen in (12): when modifying bare plural *crime, shocking* distributes to the individual events, yet, a parallel use of *shocking* shown in (13) with the bare singular *crime* is degraded. Furthermore, inasmuch as an interpretation can be recovered from (13-b), it does not concern individual shocking crime events.

(12)   a.   Crimes rattled the community.
        b.   Shocking crimes rattled the community.
              → each crime was shocking

(13)   a.   Crime rattled the community.
        b.   ?Shocking crime rattled the community.

It is possible to construct examples combining such adjectives with the non-countable use of *crime* and the definite determiner; yet, here meaning contrasts emerge. In (14-a), a predicative use of *appalling* with the definite plural of *crime* as subject preferentially yields a distributive reading, although given appropriate contextual support the collective reading may also be possible. The prenominal use in (14-b) only permits the distributive reading.[8] On the hypothesis where non-countable *crime* makes individuals, or atoms, accessible in the same manner that *furniture* or other artifactual aggregates do, the distributive readings should be available. This is shown to not be the case in (15) where, for the same sentences with non-countable *crime* in the subject position, the distributive reading is barred, and only the collec-

tive reading is possible.

(14)   a.   The crimes in Miami are appalling/horrible.
              ⇒ (✓distributive, collective possible)
        b.   The appalling crimes in Miami are the mayor's first priority.
              ⇒ (✓distributive, ✗collective)

(15)   a.   The crime in Miami is appalling/horrible.
              ⇒ (✗distributive, ✓collective)
        b.   The appalling crime in Miami is the mayor's first priority.
              ⇒ (✗distributive, ✓collective)

A different diagnostic uses predicates which reference cardinality such as *is numerous*. They combine felicitously with *furniture*, as in (16-a), where the pieces are counted, although this is impossible for substance nouns, as shown in (16-b) in absence of enriched meaning, e.g. a packaging interpretation.

(16)   a.   The furniture is numerous.
        b.   ?The water is numerous.

Applying the predicate *is numerous* to non-countable *crime*, as in (17-a), results in oddity. The same results hold in the object position of verbs such as *enumerate* or *count*. Artifactual aggregates such as *furniture* make individual pieces accessible, licensing their use with such verbs, as in (18). While, as expected, the plural of *crime* is licensed in the object position of these verbs, non-countable *crime* is not, as shown in (19).[9]

(17)   a.   ?The crime in Miami is numerous.
        b.   The crimes in Miami are numerous.

(18)   The bankruptcy judge enumerated/counted the furniture/jewelry.

(19)   a.   The council member enumerated/counted crimes that occurred on the waterfront this spring.
        b.   ?The council member enumerated/counted crime that occurred on the waterfront this spring.

A further diagnostic which brings about a contrast between the plu-

ral and the singular use of *crime* is their behavior as objects of perceptual reports. It is often assumed that events are perceptible, and a corresponding linguistic diagnostic is that event-denoting phrases are felicitous as complements of perception verbs (Higginbotham 1983; Maienborn 2011). This is indeed the case for *crimes*, yet not for bare singular *crime*, as shown in (20) and (21).

(20)   a.   Ed saw crimes on that street corner.
        b.   ?Ed saw crime on that street corner.

(21)   a.   Ed heard crimes taking place in the apartment above me.
        b.   ?Ed heard crime taking place in the apartment above me.

This indicates that bare singular *crime* does not directly refer to a perceptible event or activity, even if it indirectly refers to events, e.g. *crimes*, which are perceptible.

In sum, the data indicate that the designation of non-countable *crime* is not equivalent to a plural individual composed of individual crimes.

This contrast argues against a strong view upon which the meaning of *crime* could be reduced to a plural individual, i.e. to the meaning of *crimes*.

I will briefly discuss a different analytic possibility, namely that non-countable *crime* may not qualify as a variety of collective aggregate, akin to *foliage*. This idea receives some support from lexicographers, who have sometimes regarded the non-countable use of *crime* to be a sort of collective. The entry for *crime* from Oxford English Dictionary (2012), sense 2, distinguishes the countable and non-countable uses of *crime*:

(22)   2.a An act or omission constituting an offence (usually a grave one) against an individual or the state and punishable by law.
        2.b Such acts collectively; breaking of the law.

While there would appear to be some overlap in the designation of non-countable *crime* and a collection of crimes, it would not be apt to analyze non-countable *crime* amongst grammatical collectives. Grammatical collectives typically have the notional characteristic that the entities described by the collective are related in some manner, and

therein lies the reason for their belonging to the collective class. A typical example would be spatial proximity, whereby nouns describing swarming insects are often collectives since their referents habitually are spatially proximate to one another. As far as I can discern, this is not a notional characteristic found with *crime*, as crimes do not cluster together temporally or spatially.

2.2.3.   Non-Countable *Crime* as a Kind Referring Noun

The discussion so far has shown that the grammatical and semantic behavior of non-countable *crime* does not pattern with either substance nouns or artificatual aggregate nouns. It is worth pursing a different line of inquiry, and determining whether the grammatical and semantic behavior of non-countable *crime* might pattern with kind reference.

There is a further puzzle for theories of genericity that arises as well. For countable nouns, the bare plural form is used to refer to kinds, while, for non-countable nouns, the bare singular form is used to refer to kinds. Since *crime* has bona fide uses both as a countable and non-countable noun, what will the division of labor for reference to kinds be? In particular, is there a difference predicted between bare plural 'crimes' and bare singular 'crime'?

Both the bare singular and the bare plural form of *crime* can be used in characterizing sentences (see Krifka et al. 1995) without a great change in meaning, as shown in (23) for non-countable *crime* and in (24) for countable *crime*.

(23)   a.   Crime usually occurs where or when there are few (if any) witnesses, so lighting levels are irrelevant.
              http://www.winchelsea.net/images/lightandcrime.pdf
        b.   Crimes usually occur where or when there are few (if any) witnesses. . .

(24)   a.   Know where crimes usually happen, and be safe . . . presenting the Cordillera Crime Map of the Police Regional Office. h
              ttps://www.facebook.com/UCjaguars/posts/710528225
        b.   Know where crime usually happens . . .

Behavior with kind predicates, such as *be extinct* or *be widespread*, is more informative. Non-countable *crime* does felicitously occur with

kind predicates, as shown in (25), while these sentences appear to be degraded when the bare plural *crimes* is used, shown in (26).

(25)   a.   Crime will soon be extinct.
        b.   Crime is widespread.

(26)   a. ?Crimes will soon be extinct.
        b. ?Crimes are widespread.

     The observed contrast is supported by examining the differing rate of occurrence for the bare singular and bare plural forms. Bare singular *crime* occurs with the predicate *extinct* robustly in Google searches, an example of which is given in (27). Even the more restricted search term "crime is extinct" returned 4 examples, of which (27-b) is one. In contrast, the bare plural version was not observed. Similar results held with the predicate *widespread*, as shown in (28), except that the string "crimes are widespread" was frequently found, but this occurred only when a subkind reading was present, e.g. *violent crimes*.

(27)   a.   Could crime become extinct? Staggering figures show how crime rates have fallen by up to 70% in parts of the western world
            http://www.dailymail.co.uk/news/article-2373754/Crime-fallen-70-major-global-cities-despite-economic-crisis-rising-unemployment.html
        b.   Forty years in future America, crime is extinct. The U.S. is under strict surveillance and privacy is a thing of the past.
            https://www.wattpad.com/story/75218885-the-affinity-between-our-stars

(28)   Crime is widespread in Honduras and requires a high degree of caution by U.S. visitors and residents alike.
         www.countryreports.org/travel/Honduras/crimes.htm

Other environments known to harbor instances of nouns making reference to kinds, such as the direct object of psychological predicates (Glasbey 1994), also manifest contrasts between the use of the bare singular or the bare plural, as in (29): the bare singular is clearly licensed, while the bare plural is dispreferred, unless a subkind reading obtains, as in (29-c).

(29)   a.   The mayor hates/dislikes crime.
        b. ?The mayor hates/dislikes crimes.
        c.   The mayor hates/dislikes property crimes.

2.3. Taking Stock

The results of this section have mostly been a negative characterization of the designation of bare singular *crime*: it designates neither a substance, nor a collective, nor a plural entity. While designating some sort of event or events, it does not reference a concrete particular event in the way bare plural *crimes* seems able to do. One positive trait that can be put forth is that bare singular *crime* does manifest kind reference, at the expense of the bare plural.

     Yet, bare singular *crime* is also used in clearly episodic contexts, as in (30), which, as already shown in example (10), are number neutral, able to refer to singularities and pluralities.

(30)   Crime destroyed this town.

One line of analysis would be to consider the non-generic use of bare singular *crime* to be obligatorily non-specific, designating crimes unknown to the speaker. This would fit in well with data from existentials, which have a well-documented aversion to definite and specific noun phrases. As shown in (31), an existential sentence hosts the bare singular *crime*, yet the bare plural *crimes* is degraded.

(31)   a.   There is crime in Miami.
        b. ?There are crimes in Miami. (as an "out-of-the-blue" statement)

There is, however, a clear piece of evidence that weighs against characterizing bare singular *crime* as inherently non-specific, namely that *crime* may occur with the definite determiner and retain the reading obtained in the bare singular, as in (32). I conclude that non-specificity is not the right distinction.

(32)   The crime in Philadelphia has improved.

     What we seem to be left with is a meaning type which while somehow referring to individual crimes, does not do so overtly, and further

does not discriminate between singular and plural crimes. This situation, in many but not all ways, is reminiscent of the weakly referential meaning assigned to the semantics of nominals in incorporation constructions, which also display number-neutrality. I would like to suggest that the contrast between non-countable *crime* and countable *crime* is a reflex of a very broad distinction, articulated as early as (Strawson 1954), between general and particular modes of reference. Thus, in addition to its bare singular use to refer to an event kind, non-countable *crime* in episodic contexts is employed to refer to crime acts generally, without committing oneself to any particular events, where by 'particular', I mean with reference to spatio-temporally bounded entities. Thus when referring to particular events, the plural is appropriate, and even the bare plural of *crime* appears to imply particular events, which makes sense of its infelicity in positions where bare plurals would otherwise flourish.[10]

According to this view, *crime* makes a three-way distinction: non-countable *crime* manifests both a use referring to an event kind as well as a non-particularized use, referring to instances of crime, but without making any claims to these instances being spatio-temporally located or being of a particular number (singular or plural); both of these uses contrast with countable *crime*.

Having isolated a variety of meaning distinctions and contrasts for *crime*, I now turn to gaining a broader view on the distributional behavior of *crime*.

3.   *CRIME* **STATISTICS**

The last section explored the meaning of countable and non-countable *crime* through standard linguistic methodology. In this section, I will examine the distribution of *crime*, along with that of other select nouns, from the viewpoint of its distribution over a large corpus of occurrences. This section will add convergent evidence, first, that countable and non-countable *crime* have distinct interpretations and, second, that the bare plural of *crime* behaves more similarly to object-level referential uses of *crime* than to kind-level uses typically associated with bare plurals.

The results of this section, however, should be seen as preliminary, since I will be comparing the behavior of *crime* with the behaviors of
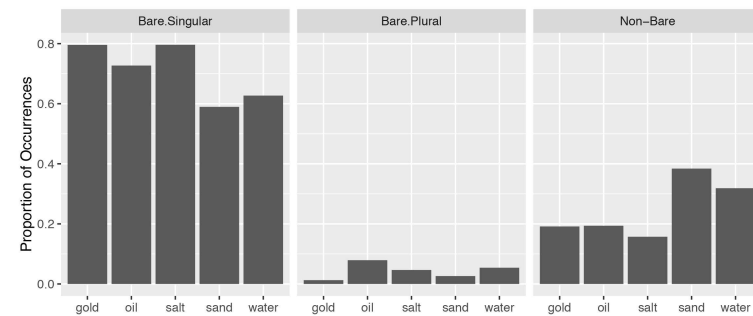

Figure 1: Distribution of Bare and Non-Bare Uses of Substance Nouns

nouns from a limited sample, and at present we do not have a general understanding of the distributional characteristics of nouns as a whole with respect to countability. Thus, there is no proper baseline established for comparison, and accordingly, there is no guarantee that the nouns I am examining, inspired by the literature, are truly representative. Similar considerations apply for the reported behavior of the bare plural. Despite these caveats, the results are suggestive and will hopefully serve to stimulate yet more comprehensive studies.

3.1.   *The Distribution of Countable Nouns, Non-Countable Nouns and* Crime

The diagnostics employed in the previous section indicated that *crime* behaved differently from either standard countable or standard non-countable nouns. A clear prediction is that these differences would be reflected in usage patterns in a corpus. I examined this prediction across a substantial portion, 88 million words, of the COCA corpus (Davies 2008), which was parsed via the Stanford Dependency Parser (de Marneffe et al. 2006), and then further analyzed using a suite of Python scripts which extracted distributional information such as argument position, co-occurrence with determiners, quantifiers, etc. Here I will only report on several broad trends that are visible in the data. Much more detailed studies using such techniques are possible and should be pursued in the future, although they are beyond the scope of this paper.
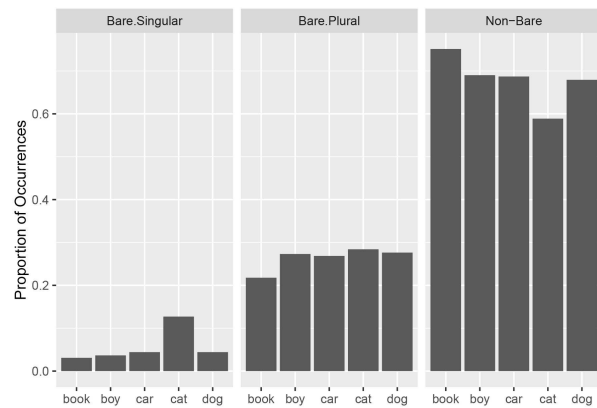
Figure 2: Distribution of Bare and Non-Bare Uses of Nouns Designating Individual Entities

The distribution of different nouns has been calculated for three noun types: bare singular, bare plural, and non-bare. "Bare" occurrences exclude determiners or quantifiers, although other modifiers, such as adjectival modifiers may be present. "Non-bare" is a catch-all category, which includes occurrences with determiners, numerals, quantifiers or possessives. The use of the bare singular indicates the noun's propensity towards interpretations associated with non-countability, e.g. a high number of occurrences for the bare singular of *water* generally corresponds to a high rate of referring to the substance water, although of course there is another use referring to the kind *water* present as well. The use of the bare plural generally corresponds to the noun's propensity towards generic/kind readings for nouns which may be countable, as well as non-standard interpretations (e.g. "packaging" or subkind readings) for non-countable nouns. Both the bare singular uses and the bare plural uses contrast with those in which the noun's reference is otherwise quantified or determined, which are the non-bare uses.

A preliminary question that must be answered before we turn to how the usage of *crime* differs from standard countable and non-

countable nouns is whether we can, in the first place, detect differences between standard countable and non-countable nouns. Figure 1 reports on the distribution of five substance nouns, which I will simply assume represent canonical non-countable nouns: *gold*, *oil*, *salt*, *sand*, and *water*. As one would expect, the vast majority of uses of all these nouns is the bare singular, while the bare plural uses, which include "packaged" as well as subkind readings, are the least frequent. Figure 2 gives the distribution of five nouns designating individual entities, which I will assume represent canonical countable nouns: *book*, *boy*, *car*, *cat*, and *dog*. In contrast to substance nouns, the large majority of uses of all of the nouns are determined/quantified (non-bare) uses, while bare singulars are the least frequent, and bare plural uses average about 26% of the occurrences. Thus, for both substance nouns and individual nouns, as far as they are represented by this sample, one can identify a single primary use, the bare singular and the non-bare use, respectively, along with secondary, minor uses.

Turning to *crime*, the observed distribution argues for two major uses, namely the bare singular use and the non-bare use, as shown in figure 3, along with a proportion of bare plural uses similar to what was observed for countable nouns. This split in usage is not unique to *crime*, but is also detectable for "flexible nouns" which have two distinct interpretations, one naming a type of entity and one naming the material composing that type of entity (see discussion in Barner & Snedeker 2005). Figure 4 shows the distributions of the nouns *brick*, *stone*, *rope* and *string*. Unlike the distributions of substance or individual nouns, there is a substantial bare singular use as well as a substantial non-bare use.[11] The distribution of *crime* and its parallel with flexible nouns as opposed to standard countable and non-countable nouns strengthens the case for two distinct interpretations of *crime* rather than deriving the non-countable uses from the countable ones or vice versa.

At this point, the general trends in the data accord with what would be expected given the results of the diagnostics in the last section. I now turn to investigating these different noun types and the interaction between syntactic position and noun type.
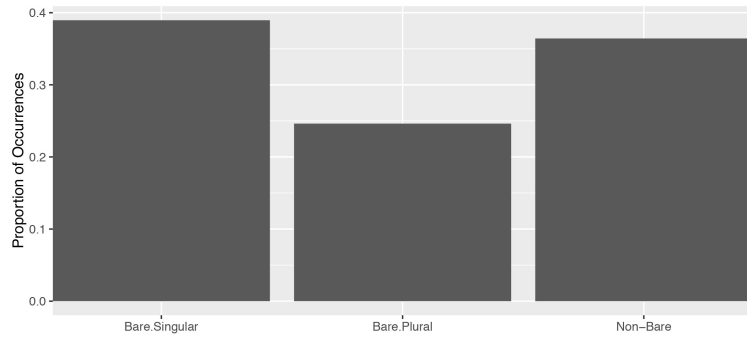
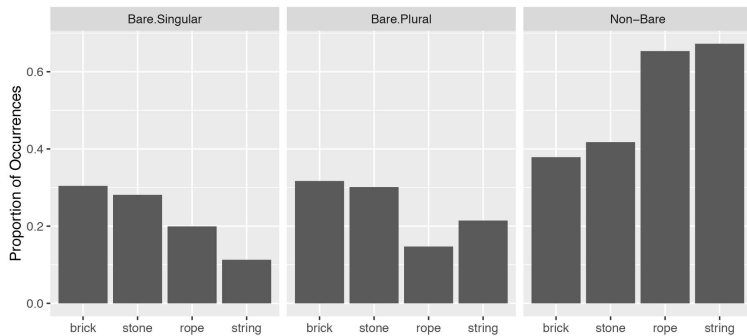Figure 3: Distribution of Bare and Non-Bare Uses of *Crime*

Figure 4: Distribution of Bare and Non-Bare Uses of Flexible Nouns

3.2. *Distribution Across Syntactic Positions*

Beyond just observing that the distribution of *crime* differs from standard countable and non-countable nouns, the corpus data add more evidence for the more specific claim put forward in the previous section, namely that the bare plural of *crime* was closer in interpretation to referential uses, in particular, not allowing the range of kind-level interpretations seen as typical of bare plurals.
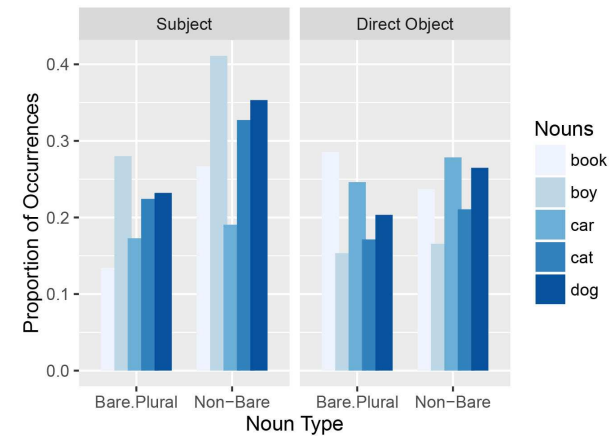

Figure 5: Distribution of Bare Plurals and Non-Bare Nouns by Argument Position

For most of the nouns which designate individual entities, e.g. *dog*, there are proportionally fewer bare plurals than nouns whose reference is determined or quantified, both in subject and direct object position. The distribution of the canonical countable nouns in subject and direct object position is given in figure 5.[12] Some exceptions to this trend are present. First, the noun *book* actually has *more* uses of bare plurals in the direct object position, which is due to a high number of incorporation-like uses with the fixed phrase *reading books*. Second, for *boy* and *cat*, the difference in proportion of use in the direct object position is not statistically significant, and similarly for *car* in subject

position. So this tendency is far from absolute, yet still seems to be robust.[13]

A more general picture results from contrasting the appearance in argument positions, which here are taken to be subject or direct object, as opposed to non-argument positions. Figure 6 shows, for the same canonical countable nouns, the mean proportion of occurrence for bare plurals and non-bare nouns contrasted across argument positions and non-argument positions. As can be readily seen, bare plurals generally occur less in argument positions and more outside of argument positions, and conversely for nouns with determined or quantified reference.

Against the backdrop of the general picture of bare plurals in countable nouns, I now turn to bare plurals of *crime*.[14] Figure 7 shows the distribution of the bare singular, bare plural and non-bare uses of *crime* contrasting the appearance in argument position or in non-argument position. The proportion of bare plurals and non-bare nouns are nearly identical (44.5% vs. 44.6%) and not statistically significant.[15] In sum, the diagnostics in section 2 indicated that the bare plural uses of *crime* behaved differently from the bare singular uses, but similarly to referential uses. The lack of distributional contrast between the bare plural uses and uses with determined or quantified reference lends supporting evidence to this observation.
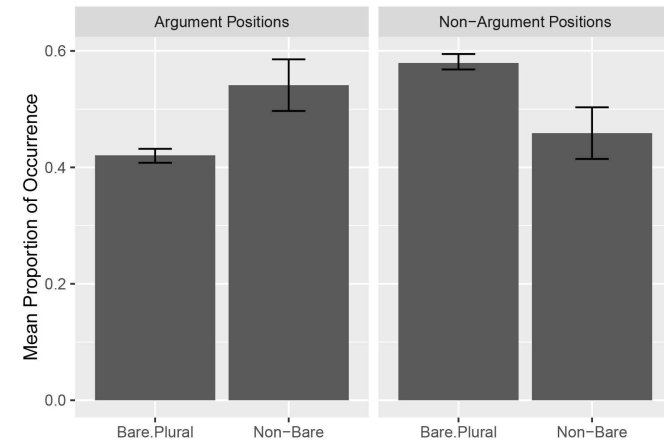

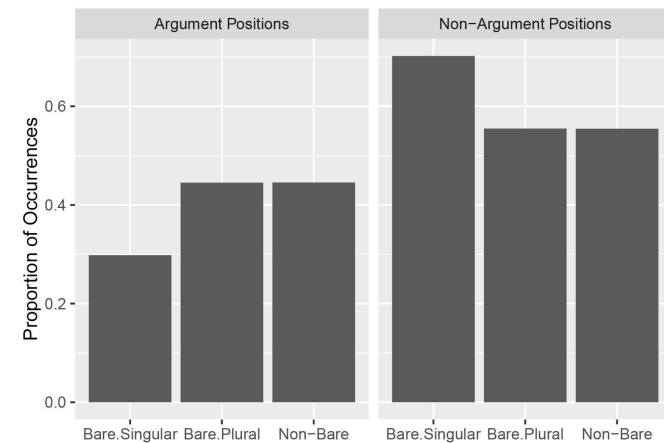Figure 6: Distribution of Bare Plurals and Non-Bare Nouns by Argument Position

Figure 7: Distribution of Bare and Non-Bare Uses of *crime* Across Argument Positions

4. CONCLUSION

This study of *crime* has shown that our empirical understanding of countability, and various other aspects of nominal semantics, is far from complete. I have argued that the contrast between countable and non-countable interpretations of *crime* do not conform to the meaning contrasts one might expect, such as atomic vs. non-atomic or inherently plural. Instead, while uses of non-countable *crime* often allow one to infer something about concrete crime events, it itself does not designate any particular crimes, but refers to crime generally. That a contrast between referring to events more particularly or more generally might result in countability contrasts is not a notion which has been widely entertained, but *crime* appears to force us to recognize the possibility.

A further implication of this study is that there is a wide range of lexical semantic work that needs to be undertaken to gain a more complete picture of how countability may be established across different semantic domains. There are a large number of similarly under- or unexplored nouns, and it remains to be seen whether the distinction proposed here for *crime* would extend to other nouns, say *practice*, *sport*, or *famine*, or if yet some further set of distinctions are in play.

Notes

[1] I would like to thank the organizers of the 11th International Symposium of Cognition, Logic and Communication, Jurģis Šķilters and Susan Rothstein, who assembled a truly engaging and enjoyable conference. I would also like to thank Fred Landman, who gave me detailed comments on a prior draft, which led to many improvements. The usual disclaimers apply.

[2] See also Behrens (1995), who discusses a wide range of nouns beyond those that dominate the literature, including *crime* and related terms such as *theft*.

[3] Here I use 'act' pre-theoretically and limit the discussion to acts which may be classified as crimes, although the picture is certainly more complicated given that non-action can also be criminal, as in the case of criminal negligence.

[4] From 1824-2013, it was a crime to "be an incorrigible rogue" in England and Wales, yet now British and Welsh citizens are at liberty to be one. http://www.dailymail.co.uk/news/article-2522671/309-crimes-removed-law-books-outdated-offences-repealed.html

[5] Examples are taken from https://www.wklaw.com/can-a-single-crime-lead-to-multiple-punishments/.

[6] Scontras & Goodman (2015) show that under certain contextual conditions, speakers may accept the collective reading, but for the purposes here, Schwarzschild's (2011) point stands.

[7] One does find many occurrences of "big crime", yet this is a fixed phrase, at least in American English, for organized crime, cf. "Big Tobacco" or "Big Oil".

[8] As is known, attributive, non-restrictive contexts often favor distributive readings (Schwarzschild 2006).

[9] Non-countable *crime* may be found with the verb *count*, but tellingly not in episodic contexts where particular crimes are at issue. A licit example is provided in the following sentence from a government pamphlet on crime in California where crime very generally is discussed: *Crime is counted in two different ways. One is based on official reports to law enforcement agencies...Crime is also counted based on surveys of individuals to determine if they have been victims of crime...* https://oag.ca.gov/sites/all/files/agweb/pdfs/cjsc/publications/misc/cinc/califcrime.pdf

[10] Although a formal analysis is beyond the scope of this paper, analyses of weak nominal reference have been advanced in multiple ways in the literature, for instance, for existentials in McNally (1997), incorporation in Farkas & Swart (2003) or Chung & Ladusaw (2004), or through Chierchia's (1998a) 'Derived Kind Predication'. Sorting out in detail to what degree these and related proposals apply to non-countable eventive nouns like *crime* and other abstract nouns is something I leave to future work.

[11] It is noteworthy that the distributions of *brick* and *stone* resemble each other, as do those of *rope* and *string*, as expected given the nearness in meaning.

[12] I have reduced the noun types to just those of interest, the bare plural and non-bare nouns, as the bare singular occurrences are not relevant for the points at hand.

[13] The general trend was present in a range of other concrete nouns that I investigated but do not report on here.

[14] A large number of uses of *crime*, over a third, were arguably subkind uses, viz. *environmental crimes*, *military crimes*, *war crimes*, which involve yet different properties that fall outside the scope of this paper. I excluded uses which were parsed as containing a compound or adjectival modifiers (the majority of which were modifiers like 'enviromental'), and uses of *crime* which governed a preposition, since these were majoritarily phrases such as *crimes against humanity*. To maintain comparability, the canonical countable noun counts shown in figures 5 and 6 were similarly reduced, although this did not affect the general trends reported for these nouns.

[15] A closer look at the distribution of subject and direct objects also shows no statistically significant distinction between bare plurals and non-bare arguments either for subjects ($\chi^2 = 3.17$, 1, .074) or objects ($\chi^2 = 2.22$, 1, .136), although there is a trend for the former.

References

Bale, Alan & Barner, David. 2009. 'The Interpretation of Functional Heads: Using Comparatives to Explore the Mass/Count Distinction'. *Journal of Semantics* 26: 217–252.

Barner, David & Snedeker, Jesse. 2005. 'Quantity judgments and individuation: evidence that mass nouns count'. *Cognition* 97: 41–66.

Behrens, Leila. 1995. 'Categorizing between lexicon and grammar: The MASS/COUNT distinction in a cross-linguistic perspective'. *Lexicology* 1: 1–112.

Chemerinsky, Jeffrey M. 2009. 'Counting Offenses'. *Duke Law Journal* 709–746.

Cheng, Chung-Ying. 1973. 'Comments on Moravcsik's paper'. In Jaakko Hintikka, Patrick

Suppes & J.M.E. Moravcsik (eds.) 'Approaches to Natural Language: Proceedings of the 1970 Stanford Workshop on Grammar and Semantics', 215–220. Dordrecht: Reidel.

Chierchia, Gennaro. 1998a. 'Reference to kinds across languages'. *Natural Language Semantics* 6: 339–405.

——. 1998b. 'Plurality of Mass Nouns and the Notion of "Semantic Parameter"'. In Susan Rothstein (ed.) 'Events and Grammar', 53–104. Dordrecht: Kluwer Academic Publishers.

Chung, Sandra & Ladusaw, William A. 2004. *Restriction and Saturation*. Cambridge, MA: MIT Press.

Crain, Hillary Jerrol. 1959. 'Criminal Law - Prosecution for Two Crimes Resulting from a Single Criminal Act'. *Louisiana Law Review* 19: 868–872.

Davies, Mark. 2008. 'The Corpus of Contemporary American English: 450 million words, 1990 present'. Available online at http://corpus.byu.edu/coca/.

de Marneffe, Marie-Catherine, MacCartney, Bill & Manning, Christopher D. 2006. 'Generating Typed Dependency Parses from Phrase Structure Trees'. In 'LREC', .

Deal, Amy Rose. To appear. 'Countability distinctions and semantic variation'. *Natural Language Semantics* .

Farkas, Donka & Swart, Henriëtte de. 2003. *The semantics of incorporation: From argument structure to discourse transparency*. Stanford, CA: CSLI Publications.

Glasbey, Sheila. 1994. 'Bare Plurals in Object Position: Which Verbs Fail to Give Existential Readings, and Why?' In Liliane Tasmowski & Svetlana Vogeleer (eds.) 'Indefiniteness and Plurality', Amsterdam: Benjamins.

Grimm, Scott. 2012. *Number and Individuation*. Ph.D. thesis, Stanford University.

——. 2014. 'Individuating the Abstract'. In Urtzi Etxeberria, Anamaria Fălăuş, Aritz Irurtzun & Bryan Leferman (eds.) 'Proceedings of Sinn und Bedeutung 18', 182–200. Bayonne and Vitoria-Gasteiz.

Higginbotham, James. 1983. 'The logic of perceptual reports: An extensional alternative to situation semantics'. *Journal of Philosophy* 80, no. 2: 100–127.

Krifka, M., Pelletier, F., Carlson, G., ter Meulen, A., Chierchia, G. & Link, G. 1995. 'Genericity: An Introduction'. In G. Carlson & F. J. Pelletier (eds.) 'The Generic Book', 1–125. Chicago: Chicago University Press.

Landman, Fred. 2016. 'Iceberg Semantics for Count Nouns and Mass Nouns: Classifiers, Measures and Portions'. In Jurģis Šķilters & Susan Rothstein (eds.) 'Proceedings of 11th International Symposium of Cognition, Logic and Communication', Riga, Latvia.

Link, Godehard. 1983. 'The logical analysis of plurals and mass terms: A lattice-theoretical approach'. In Rainer Bauerle, Christoph Schwarze & Arnim von Stechow (eds.) 'Meaning, use, and interpretation of language', Berlin: de Gruyter.

Maienborn, Claudia. 2011. 'Event Semantics'. In Claudia Maienborn, Klaus von Heusinger & Paul Portner (eds.) 'Semantics. An international handbook of natural language meaning', *HSK Handbook series*, vol. 1. Berlin, New York: Mouton de Gruyter.

McNally, Louise. 1997. *A Semantics for the English Existential Construction*. New York: Garland Press.

Oxford English Dictionary. 2012. Oxford University Press. Online Edition.

Quine, W. V. O. 1960. *Word and Object*. Cambridge, MA: MIT Press.

Rothstein, Susan. 2010. 'Counting and the Mass/Count Distinction'. *Journal of Semantics* 27: 343–397.

Schwarzschild, Roger. 2006. 'The Role of Dimensions in the Syntax of Noun Phrases'.

Syntax 7, no. 2: 32–75.

——. 2011. 'Stubborn Distributivity, Multiparticipant Nouns and the Count/Mass Distinction'. In Suzi Lima, Kevin Mullin & Brian Smith (eds.) 'Proceedings of the 39th meeting of the North East Linguistics Society (NELS 39)', vol. 2, 661–678. Amherst, MA: GLSA.

Scontras, Gregory & Goodman, Noah D. 2015. 'Interpreting collective predication'. Talk presented at Workshop on Experimental Approaches to Semantics (ExAS), ESSLLI 2015.

Strawson, Peter F. 1954. 'Particular and General'. In 'Proceedings of the Aristotelian Society', vol. 54, 233–260.