

# Creativity in Nominal Mass-Count Coercions

Ellise Moon, Kai Schenck, & Scott Grimm

University of Rochester

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## Nominal Countability

Research on nominal semantics often partitions nouns into the categories COUNTABLE and NON-COUNTABLE

- ▶ Countable nouns in English like *apple*, *dog*, and *textbook* occur with plural syntax, combine directly with numerals, and combine with count determiners like *many*
- ▶ Non-countable nouns like *mud*, *faith*, and *beer* do not combine with plural syntax or numerals and occur with determiners like *much*

## Nominal Countability

However, as all of these researchers have pointed out, the situation is not so simple

- ▶ Many nouns—at least as lexemes—may belong to both classes, and are often called DUAL-LIFE or flexible nouns (Rothstein 2010; Pelletier 2011; Kiss, Pelletier, Husic, and Poppek 2017)
- ▶ Even nouns which seem to almost exclusively prefer one class, such as strongly non-countable nouns (Grimm, Moon, and Richman 2021), can still be found in countable occurrences in a few context-sensitive, COERCED readings

## DUAL-LIFE Nouns

Both countable and non-countable readings are common for all  
DUAL-LIFE nouns

- (1) a. A few times I was offered more beer but had already drunk *two ales* and found that sufficient.  
b. *Ale* is a type of beer brewed from malted barley using a warm fermentation with a strain of brewers' yeast.
- (2) a. The cars on the highway are still making *too much noise*.  
b. She heard *four noises* but was unable to definitively say if they were gunshots.

## COERCED Count Reading

Many strongly non-countable nouns still allow a COERCED count reading in specific contexts

- (3) They have challenged both the *optimisms* and the *pessimisms* developed in the West.
- (4) The timing of the two *eradications* is important.
- (5) Don't even bother trying to decipher these *graffitis*.

## Understanding the Landscape

We attempted to answer some questions to determine the empirical landscape of a noun's uses across different countability categories

- ▶ Can every noun be coerced or are there limitations?
- ▶ What is the meaning difference, or meaning differences, between 'regular' and coerced uses of a noun?
- ▶ Are there a limited number of these polysemy relations or is it only bound by speaker creativity?
- ▶ If we accept the categories COUNTABLE and NON-COUNTABLE, how do we account for DUAL-LIFE nouns and nominal COERCION? Are these a third class of nouns entirely?

## Flexibility of Nominal Countability

Nominal flexibility—infidelity to a particular countability class—is usually taken to be either a **bug** or a **feature** of a semantic system.

As a **bug** of nominal semantic systems

- ▶ may be effectively ignored (often practiced, rarely argued for)
- ▶ may be patched via a few specialized functions such as the UNIVERSAL GRINDER/PACKAGER/SORTER (Pelletier 1975; Bunt 1985; Bach 1986; Zamparelli 2020)
- ▶ can be treated as a handful of regular polysemy relations (Ostler and Atkins 1992; Copestake and Briscoe 1995)

## Flexibility of Nominal Countability

Nominal flexibility—infidelity to a particular countability class—is usually taken to be either a **bug** or a **feature** of a semantic system.

As a **feature** of nominal semantic systems

- ▶ may be considered as “nominal elasticity” (Chierchia 2010) and one of the “Universal Properties” of mass nouns
- ▶ could be taken as data that there is no underlying count/non-count divide (Borer 2005)



## Flexibility of Nominal Countability

Our research suggests a third possibility for how to approach this nominal flexibility, as an **exploitation** speakers employ

- ▶ there exist regular sense alternations between countable and non-countable instances, where the ultimate interpretation is informed by the domain of the noun (substances, events, etc.)
- ▶ for some lexemes this is clearly conventionalized
- ▶ for others, these general sense alternation can be exploited in creative ways in new domains (for a related proposal see Falkum 2017)

These sense relations are not “universal functions” but rather regular alternations that can also extend to novel cases.

## Types of Flexibility

The relation between the non-countable noun and the counted unit ranges from highly conventionalized to highly context-dependent

- (6) a. If a few raccoons attack, they may eat several *chickens*.  
b. I told my husband we were having *chicken* for dinner.
- (7) You can drink two *rums* in five minutes, can't you?
- (8) *Several creams* are available that can reduce itching and discomfort from these rashes.
- (9) The relative *acidities* of water and methanol have been a nagging issue.

# Outline

Introduction: Nominal Countability

Background: Approaches to Coercion

Data and Methodology

Coercion

Types of Coercion

Triggers of Coercion

The Quantitative Picture

Conclusion

## Approaches to Coercion

Many different coercion operations have been proposed (see also Husić 2020 and Zamparelli 2020 for further discussion), including but not limited to:

- ▶ UNIVERSAL GRINDER (Pelletier 1975)
- ▶ UNIVERSAL PACKAGER (Bach 1986)
- ▶ UNIVERSAL SORTER (Bunt 1981, 1985)
- ▶ “Nonce substances” and “Abstracts and Event Instantiation” (Payne and Huddleston 2002)
- ▶ “Event Packaging” (Grimm 2014)

However, there seems to be no consensus or a clear understanding of how all the different coercion functions relate, if at all.

## Cross-Linguistic Puzzles

Although phenomena like PACKAGING and GRINDING are purportedly “universal,” there are many cross-linguistic differences

- ▶ Wiese and Maling (2005) show that even closely-related languages (English, German, and Icelandic) show clear differences in how and what can be “packaged”
- ▶ Grimm and Dočekal (2021) show that in Czech nominal flexibility is severely limited

While we are focusing on English data, the empirical results will have implications for coercion phenomena cross-linguistically.

## Motivations

To better understand the range of meaning relationships between non-countable lexemes and countable instances of those lexemes, we wanted to compile a large-scale dataset of corpus examples of coercion in English.

We specifically wanted to get beyond “restaurant talk” and other standard food and drink portioning examples.

We also wanted to annotate our data in a way that allowed us to get a quantitative picture of the frequency and types of coercion.

## Data Collection

We combined two datasets, extending the data gathered in some of our previous research

- ▶ Nouns from our dataset of strongly non-countable nouns (SNC) (Grimm, Moon, and Richman 2021) for which at least some context-specific count instances could be found
- ▶ Nouns labeled as “both mass and count” from the Bochum English Countability Lexicon (BECL 2.1) (Kiss, Pelletier, Husic, Simunic, et al. 2016).

## Data Collection

Additionally, we made some adjustments to the data so the formatting was equivalent

- ▶ As nouns from BECL had been labeled with WordNet senses (Princeton University 2010), we added sense data to the examples for the SNC data
- ▶ We removed a few examples, which were from the SNC data, for which we could not identify a relevant WordNet sense



## Data Collection

We then found examples of coercions for all noun-sense pairs from the BECL data, as well as additional examples for the SNC data

- ▶ We focused solely on non-countable to countable coercions, not UNIVERSAL GRINDER type coercions
- ▶ While COCA and Google Books provided many examples, we also used Google searches to find additional examples from scientific papers, news articles, and a few blog and forum posts
- ▶ The resulting dataset contains 1,465 example sentences of 832 noun-sense pairs, with direct links to the source of each example and the annotation for the coercion type and trigger

# Data Collection

noun	sense	definition	example	example source	example reading
abolition	1	the act of abolishi	Thirty-two abolitions against the death penalty took place in Europe from 1980 to 2007, with 28	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	(adhoc,plural)
abolition	1	the act of abolishi	New oral traditions developed throughout the period of slavery as slaves were forbidden to rea	<a href="https://www.journals.org/">https://www.journals</a>	(adhoc,plural)
abolition	1	the act of abolishi	Secondly, what does the timing of this shift, if definable, suggest about its causes: how far in oth	<a href="https://cercles.com/r/">https://cercles.com/r/</a>	(type,plural)
absence	4	the occurrence of	This is a reliable test for the diagnosis of absence seizures: a patient suspected of typical absenc	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	(modind,ellipsis)
abstinence	1	the trait of abstair	alcoholics can undergo multiple abstinences from alcohol in their lifetime.	<a href="https://www.ncbi.nlm.nih.gov/">https://www.ncbi.nlm</a>	(adhoc,plural)
abstinence	1	the trait of abstair	One subject significantly decreased drinking on the ethanol spout during all three abstinences.	<a href="https://www.ncbi.nlm.nih.gov/">https://www.ncbi.nlm</a>	(adhoc,plural)
abstinence	1	the trait of abstair	Some were isolated and monitored and their abstinences confirmed.	<a href="https://pubmed.ncbi.nlm.nih.gov/">https://pubmed.ncbi</a>	(adhoc,plural)
acceptability	1	satisfactoriness by	It is to be emphasized however, that in Equation (13.5) the acceptabilities from the experiment	<a href="https://books.google.com/">https://books.google</a>	(degree,value)
acceptability	1	satisfactoriness by	The relative acceptabilities of these formulations may influence patient adherence	<a href="https://www.researchgate.net/">https://www.research</a>	(degree,value)
acclimation	1	adaptation to a ne	...even though the plant exhibits several acclimations to CO2 enrichment which result in a reduc	<a href="https://www.ncbi.nlm.nih.gov/">https://www.ncbi.nlm</a>	(adhoc,plural)
acclimation	1	adaptation to a ne	Acclimations to low and high light levels are located in opposite extremes.	<a href="https://www.sciencedirect.com/">https://www.science</a>	(type,relational)
accordance	1	concurrence of op	Although no attempt will be made here to describe what constitutes 'acceptable accordances' b	<a href="https://books.google.com/">https://books.google</a>	(type,plural)
accordance	1	concurrence of op	The CAU has generated agreements and accordances with different countries of the world that	<a href="https://issuu.com/usl/">https://issuu.com/usl</a>	(type,relational)
accretion	1	an increase by nat	The results obtained show that a single normal galaxy begins to resemble a cD giant after sever	<a href="https://ui.adsabs.harvard.org/">https://ui.adsabs.har</a>	(adhoc,plural)
accretion	3	(astronomy) the fo	We present a numerical simulation for the evolution of massive cluster galaxies due to the accre	<a href="https://inis.jaea.org/">https://inis.jaea.org/</a>	(adhoc,plural)
accrual	1	the act of accumu	Laurence acquired the items while doing research for his 1981 book "Hemingway and the movi	<a href="https://opspecialcollection.org/">https://opspecialcolle</a>	(adhoc,plural)
accumulation	3	the act of accumu	If several accumulations are used, phase cycling schemes can be applied to suppress unwanted	<a href="https://onlinelibrary.wiley.com/">https://onlinelibrary</a>	(adhoc,plural)
acetate	1	a salt or ester of a	Many industrial solvents are acetates, including methyl acetate, ethyl acetate, isopropyl acetate	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	(type,plural)
acid	1	any of various wat	Acids form aqueous solutions with a sour taste, can turn blue litmus red, and react with bases a	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	(type,plural)
acidity	3	pH values below 7	The relative acidities of water and methanol have been a nagging issue.	<a href="https://eric.ed.gov/?id=ED031000">https://eric.ed.gov/?i</a>	(degree,value)

Figure: screenshot of a portion of the final dataset

## Annotation

We built off the annotation schema previously developed for the SNC data, but the larger variety of examples challenged us to generalize some of the coercion types previously identified

- ▶ We included examples previously labeled as JARGON, since we are now directly interested in these coercions specific to contexts (law, religion, sciences, math, etc.)
- ▶ Once we'd finalized an annotation schema, we assigned each of the examples a coercion type and a trigger of that coercion

## Annotation

Annotations are split into types and triggers of coercion

- ▶ The **type of coercion** corresponds to the semantic shift in meaning of a noun from the non-countable use to the countable use
- ▶ The **trigger of coercion** is the morphosyntactic features of a noun in a given context
- ▶ Not all triggers are found with all coercions, and vice-versa

Distinguishing the type of coercion from the trigger allowed us to look more broadly at the types of meaning shifts in the data.

**coercion**

ad hoc

inalienable possessor

natural atom

type

degree

individuation modification

**trigger**

pluralization

possession

relational

possession

pluralization

pluralization

possession

relational

value

ellipsis

## Ad Hoc Coercion

AD HOC coercion is a general expansion of the UNIVERSAL PACKAGER (Bach 1986) to include all types of portioning and packaging

It thus covers any coercion which creates ‘ad hoc’ units, either based on standard portions or context-specific portioning (including event ‘units’ bound by distinct points in time)

- (10) Safeway has a great deal on Barilla products: buy two sauces and get two *pastas* free!
- (11) It took several *emigrations* to get us to the four corners of the earth.

## Ad Hoc Coercion

- ▶ Previously the literature has restricted packaging and portioning primarily to concrete nouns, often “standard units” of food and drink nouns (see discussion in Zamparelli 2020)
- ▶ Our previous work (Grimm, Moon, and Richman 2021) identified separate PACKAGING and EVENT coercions; however, we found no reason to distinguish ad hoc unit portioning in space vs. in time so we collapsed these categories.
- ▶ AD HOC is a productive coercion, applying to concrete nouns, abstract nouns, and event nouns

## Inalienable Possession

A similar, but distinct type of coercion is INALIENABLE POSSESSION.

This coercion applies to cases where the noun coerced refers to some body part or state of being of an animate possessor.

- (12) The *skins* of different people vary in susceptibilities to irritation.
- (13) When Aileen had barely reached puberty herself she claimed the *virginities* of a number of Troy and Rochester's neighbourhood boys.



## Inalienable Possession

- ▶ While we initially considered these examples as just AD HOC coercion, we realized they have a unique relationship with the trigger of coercion—plural possessive constructions
  - ▶ While INALIENABLE POSSESSION can be thought of as a type of portioning, the ‘unit’ provided is not ad hoc, but always some number of distinct, animate individuals which provide ‘natural units’ for counting a non-countable property or substance
- (14) These cows had to be washed regularly, because if they happened to lie in dung, their *hides* could stain.

## Natural Atom

The NATURAL ATOM coercion applies only to the kinds of nouns which refer to elements, chemical compounds, viruses, or bacteria.

These nouns can be coerced from their standard non-countable substance reading to a countable reading referring to individual atoms, molecules, or cells, but only in 'microscopic' contexts.

(15) Calcium chloride has two *chlorines* for each calcium.

(16) Maltose is created by condensation reaction of the two *glucoses*, forming a  $\alpha$ -1,4-O-glycosidic linkage.

## Natural Atom

- ▶ This coercion is not just AD HOC as there is nothing ad hoc about the identification of a ‘standard unit’ since these nouns already contain a ‘unit’ in their minimal atomic parts
- ▶ Even though this coercion is only found in specific contexts (scientific and medical writing), it is not context-dependent; there is no other possible ‘unit’ for *oxygen* than its atom
- ▶ This type of coercion is likely a type of regular polysemy, though infrequent outside of scientific contexts and perhaps thus unfamiliar to many speakers

## Type Coercion

TYPE is the most productive coercion, with very few restrictions on classes of nouns that it can apply to.

(17) Jobs require multiple *proficiencies* and teamwork.

(18) *Cyanides* are produced by certain bacteria, fungi, and algae.

(19) Whitening *toothpastes* are also a good choice for reducing stains.

(20) This study attempts to investigate the comparison of these *folklores* using a comparative literary theory.

## Type Coercion

- ▶ Our previous work distinguished ENTITY TYPE and EVENT TYPE, but here we found no linguistic basis for separating these, as the shift in meaning is the same regardless of noun class
- ▶ This coercion is very prolific, and accounts for around two-thirds of our dataset (1016 of 1465 examples)
- ▶ While familiar cases (e.g. *wines*) may have established ‘types’ familiar to speakers (e.g. *red, white, rosé*), most instances of this coercion involve types only familiar within a given context

## Degree Coercion

DEGREE coercion occurs when values of some unit of measurement are identified in context, creating units for counting.

- (21) The *heats* of formation of trimanganous phosphate and trimagnesium phosphate.
- (22) Barley was germinated in soils of two *moistures* (40 and 50 percent).
- (23) Sailors call the *latitudes* between 40 and 50 degrees south of the equator the Roaring Forties.

## Degree Coercion

- ▶ DEGREE coercion only applies to a few nouns, those which refer to measurement systems or properties which can be quantitatively measured (location, time, temperature, motion)
- ▶ DEGREE coercion is only triggered in contexts where multiple values (e.g. percents of moisture, degrees of temperature) have been established, often specific numerical values
- ▶ This coercion is unique in that the non-countable noun undergoing coercion to a count reading is a property or system of measurement itself, not a substance, object, or concept

## Modification Individuation

Modification individuation occurs when a non-countable noun modifies an elided count noun, taking on its plural morphology.

- (24) If there really were 6 vanilla and 6 peanut butter candies in the box, what is the probability that you would have picked three *vanillas* in a row?
- (25) I've used several *soys*, soy blends, and palms.
- (26) In some cases, with the use of conventional gauze dressing, we have to use several *gauzes* to achieve hemostasis.



## Modification Individualization

- ▶ Modification individualization exploits ellipsis to count the modifier of a noun, not the noun itself
- ▶ This is thus not a true instance of coercion, since usually non-countable nouns (e.g. *vanilla*) are being used to reference the entire countable object they modify (e.g. *vanilla candies*)
- ▶ In all these cases, the elided noun can be re-inserted, re-combining with the count syntax

## Pluralization

The most frequent and versatile trigger of coercion, pluralization triggers AD HOC, NATURAL ATOM, and TYPE coercions.

- (27) There are a variety of different fruit *juices* that a person can drink.
- (28) In six *redistributions*, the team has distributed more than 100kg of food.
- (29) Two *ozones* can combine to form three *oxygens*, and that is what happens.

## Possession

Possessive constructions can trigger AD HOC and TYPE coercions, and always is the trigger for INALIENABLE POSSESSION, using the genitive 's ending, 'of' constructions, or possessive pronouns

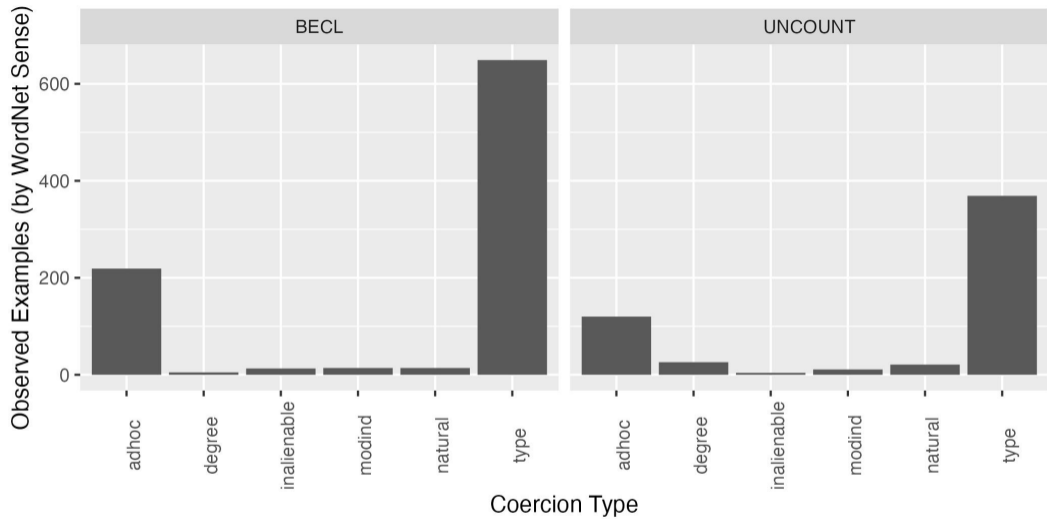
- (30) Underinsurance is what greatly amplifies these countries' *recessions*.
- (31) The aim of this study was to analyze the differences between the *handwritings* of schizophrenia patients and healthy subjects.
- (32) In 1951 she married Tony Curtis when their *stardoms* were at a peak.

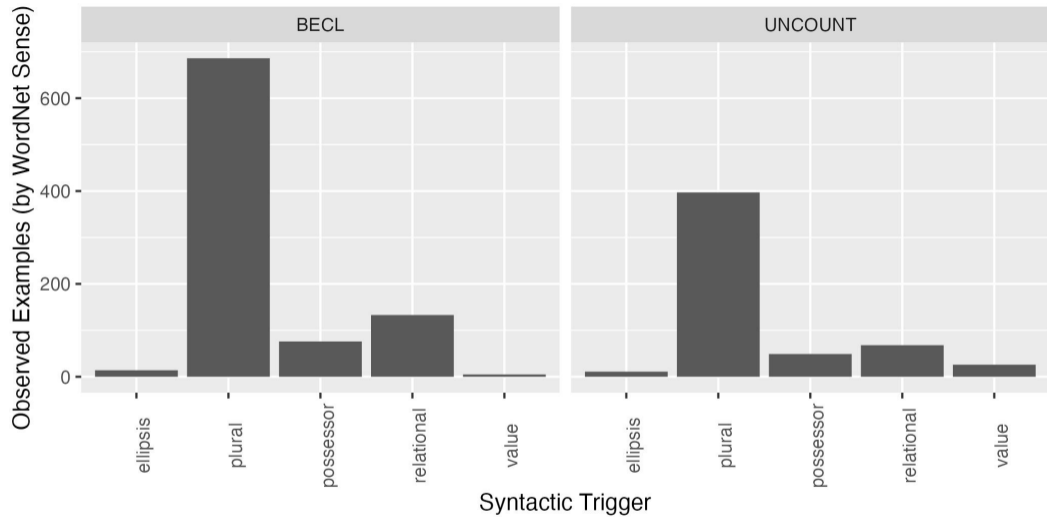
## Relational

Relational constructions trigger TYPE coercions and, less frequently, AD HOC coercions.

- (33) His *loves* for his family and for his country are musts, and he will bring all of the memories he can with him.
- (34) *Communities* of interest bring together several *communities* of practice that represent groups of practitioners from different domains.

<b>coercion</b>	<b>trigger</b>	<b>frequency</b>
ad hoc	pluralization	321
	possession	9
	relational	9
inalienable possessor natural atom type	possession	17
	pluralization	35
type	pluralization	727
	possession	99
	relational	192
degree	value	31
individuation modification	ellipsis	25
<b>total instances</b>		<b>1465</b>





## Contributions

A large amount of new data that allowed for both a fine-grained look at individual examples as well as broad patterns of coercion.

We discovered and detailed coercions previously undiscussed in the literature—INALIENABLE POSSESSION, NATURAL ATOM, DEGREE.

Separating **type of coercion** from the syntactic **trigger of coercion** allowed us to summarize the ways in which meaning is shifted between non-countable and countable instances.

While we certainly haven't found all instances, our dataset is large enough to capture the major coercion types their frequencies.



## Conclusion

To return to our questions from earlier

- ▶ DUAL-LIFE nouns and nominal COERCION occur frequently across English in many different contexts
- ▶ There seem to be a handful of consistent types of meaning shifts, some more frequent and flexible than others
- ▶ Many of these coercions generate ‘units’ for counting, either by creating ad hoc “portions” or referencing types; others are more specific, like degrees of a scale

## Conclusion

As a big-picture approach to coercion in English, our data shows that many different instances of coercion seem to pattern in a consistent number of ways.

Countability shifts may be viewed as neither a **bug** nor a **feature**, but an oft-conventionalized and sometimes creative **exploitation** of interpretations associated with (domain-specific) countable and non-countable meaning types.

# Thank You!

Ellise Moon, [ellise.moon@rochester.edu](mailto:ellise.moon@rochester.edu)

Scott Grimm, [scott.grimm@rochester.edu](mailto:scott.grimm@rochester.edu)

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