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Multiple shifts: new views on pathways and mechanisms of grammaticalization in the English noun phrase

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In this paper we report on a historical corpus study of English *multiple*, an adjective which underwent a process of grammaticalization starting from lexical uses with the meaning 'composite', e.g. *HR 3617 is a* ***multiple*** *star*, to grammaticalized uses as individualizer, paraphrasable as 'different', e.g. *She has to perform* ***multiple*** *tasks at the same time*, and as quantifier 'several', e.g. *I have* ***multiple*** *friends in high society*. *Multiple* is just one of several adjectives going down this path of grammaticalization. However, as we show in this paper, the trajectory of each adjective includes different micro-processes of change. New diachronic case studies on the grammaticalization of individual items thus remain crucial to further advance our understanding of the potential environments and changes underlying grammaticalization processes. The case of *multiple* shows that, firstly, not only attributes, but also classifiers can serve as input for grammaticalization, and that, secondly, grammaticalization and lexicalization processes can have non-adjacent functions in the noun phrase as their input and output.

1. Introduction

Changes in the English noun phrase (henceforth NP) have been a fruitful topic of study within research on grammaticalization and subjectification in recent years. Studies dedicated to the NP include Adamson (2000); Breban (2010); Davidse *et al*. (2008a); Ghesquière (2009); Paradis (2000); Vandewinkel & Davidse (2008) on the processes of change affecting individual items, and Brems (2011); Davidse *et al*. (2008b); Denison (2002); Keizer (2007); Margerie (2010); Traugott (2008) on the reanalysis of determiner + noun + *of* constructions, such as *a lot of*, as modifiers in the noun phrase. The changes were typically described with reference to a functional model of the English noun phrase, in line with among others Bache (2000); Halliday (1994 [1985]); Quirk *et al*. (1985), which lends itself well to discussion of grammaticalization and subjectification. The point of departure for the model is that elements in the English NP can fulfill a range of functions, i.e. determiner/quantifier, secondary determiner/quantifier, attribute, classifier, head noun. The NP *the usual long country walk* contains elements of all five functions.

Walk is the head noun, which presents the type of thing instantiated by the referent. The definite article *the* fulfils the function of determiner and specifies the identifiability of the referent. Other functions that are of significance for the present article are the three types of modifiers associated with

positions between head noun and determiner, and we will give brief definitions for each to ensure clarity (for a more detailed overview, see Breban 2010: 11–39). The noun *country* functions as classifier in this example because it restricts the denotation of the head noun *walk* to a subtype, *country walks*. *Long* has the function of attribute, as it describes a property of the referent. In this case, it describes a particular country walk as being long in extent or duration. One feature particular to attributes is that they alternate with a different construal type, predicative construal, as in *the country walk is long*. *Usual*, the third modifier in this example, illustrates the function of secondary determiner. As the label implies, its function is to add additional information to that provided by the determiner, which helps the identification of the referent. In the example, *usual* specifies that this long country walk can be identified because it is that walk which speaker and hearer are familiar with through prior, frequent experience.

When several of these functions are realized within the same NP, they tend to be ordered in a particular left-to-right sequence:

determiner/quantifier > secondary determiner/secondary quantifier > attribute > classifier > (potentially compound) head noun.

Figure 1. Model of the English NP

It has to be emphasized that not all functions have to be realized at the same time in a single NP, and that some functions such as attribute and classifier can have multiple realizations in one NP. Some examples of NPs, with their functional analysis, are

(1)	the	long	board	meeting	
	determiner	attribute	compound	head noun	
(2)	three	other	fresh	red	peppers
	quantifier	secondary determiner	attribute	classifier	head noun
(3)	the	first	Belgian	European	champion
	determiner	secondary quantifier	classifier	classifier	head noun

The functional model has some important implications for diachronic change. The sequence of functions can be divided internally in terms of the grammatical-lexical distinction: on the right-hand side we find the attribute, classifier and head noun functions that are associated with lexical meanings, whereas the left-hand side represents the grammatical functions of determination and quantification. Accordingly, diachronic processes of lexicalization and grammaticalization have been associated with rightward and leftward movement in the NP respectively (Adamson 2000; Breban 2010).[1]

This paper discusses the findings of a corpus study on the development of the adjective *multiple* into an unspecific quantifier in Modern English. The adjective's relatively recent acquisition of a quantifier use is part of a wider trend in Late Modern English whereby a whole range of adjectives such as *various*, *divers(e)* and *numerous* come to function within the quantifier paradigm (Denison 2006, 2010; Breban 2008, 2010, 2014). The processes underlying this diachronic shift nevertheless differ from adjective to adjective. In this paper we add a new descriptive case study, which shows yet other mechanisms and pathways of change leading to a new quantifier function. This case study hence underlines the importance of looking at individual case studies if one wants to fully understand the processes and mechanisms involved in abstract pathways of change. The development of *multiple* is not only relevant for the better understanding of the development of new quantifiers in English. As we will argue in Section 5, it has wider implications for existing hypotheses and assumptions about pathways and mechanisms of change in the English NP. The data for the corpus study include historical data sets for the Modern English period as well as a data set for Present-day English.

We will start our paper by briefly summarizing the results of two earlier studies of adjectives developing into quantifiers: in Section 2, we summarize Breban's (2008) study of *several*, which constitutes a point of departure for many later descriptions of adjectives developing into quantifiers, and in Section 3, the recent study of *various* and *numerous* (Breban 2014). In Section 4, we present the results of our new corpus study for *multiple*. In Section 5, we discuss the implications of our findings for the development of quantifiers, and for ideas about possible pathways and mechanisms of change

[1] Adamson (2000) and Ghesquière (2014) also discuss directionalities of subjectification and intersubjectification. We will not mention these in detail as our case study involves grammaticalization and lexicalization.

in the English noun phrase in general. In the concluding section (Section 6), we summarize our arguments.

2. The development of *several* (Breban 2008)

The development of new unspecific quantifiers has been studied by Denison (2006, 2010) and Breban (2008, 2010, 2014). One of the best-developed descriptions, because the historical data present a clear path of development, is that of *several*. Breban (2008: 278–283) shows how *several* could be used as attribute in the NP, as in (4–5), and argued that *several* acquired its quantifier function through a two-step grammaticalization process with this attribute use as input.

Several was originally used as an attribute, i.e. a lexical, descriptive adjective, referring to the property of being 'distinctive, separate, different'. Examples (4–5) illustrate this attribute use in the prenominal and predicative construal respectively.

(4) All men should marke theyr cattell with an open **severall** marke upon theyr flanckes. (OED s.v. *several*, 1596: Spenser State Irel. Wks. (Globe) 681/2)

(5) So oweste thow, Alexander, to haue v messagers and v consaillours, and euery of tham shall be **seuerall** [orig. *per se separatus*]. (OED s.v. *several*, 1422: J. Yonge tr. *Secreta Secret.* xlvi. 209)

'So you ought, Alexander, to have five messengers and five counsellors, and every of them shall be separate (have a separate status).'

From this attribute use, the adjective developed a first grammatical use as an individualizer, which serves to indicate that a (notionally and/or syntactically) plural referent is to be conceptualized not as a single referent or plural mass, but rather as separate, individual instances. Individualizers make the heterogeneous conceptualization of the referent explicit and hence facilitate either the quantification, as in (6) and (8), or the identification, as in (7), of the plural set. Hence, they function as secondary determiners/quantifiers.

(6) That they [*sc.* the Septuagint translators] were placed everie one in a **several** Conclave. (OED, s.v. *conclave*, *a*1646 J. Gregory *Posthuma* (1649) 12)

(7) I doe not like these **seuerall** councels. (OED s.v. *several*, 1597: Shakespeare *Richard III* iii. ii. 73)

(8) The *Alberghi* or Halls of the eight **several** Nations..of the Order. (OED s.v. *albergo*, 1673: Ray *Journ. Low C.* 303)

The contexts in which individualizers such as *several* occur typically foreground the relevance of the individual instances that are singled out, as is the case in e.g. distributive contexts as in (6) or in contexts where the instances are counted, as in (8).

Breban proposes that, on the basis of this individualizer use, *several* then developed a second grammatical use as an unspecific quantifier. The quantifier use, illustrated in (9–10), *does* the actual counting of the instances within the plural set; it expresses that there are 'more than one, but not too many' of these instances. *Several* no longer facilitates the quantification, but performs it.

(9) During which times he received **severall** sums of money to the value of 300*l*. (OED s.v. *several*, ?1661: *12th Rep. Royal Comm. Hist. MSS* (1890) App. V. 6)

(10) Now he was able to purchase a decked vessel of twelve tons in which he made **several** successful commercial voyages to the Connecticut coast. (from the Present-day English Collins Wordbanks*Online* corpus, abbreviated as COW)

Breban (2008) showed how each of the two steps was accompanied by a reduction of usage contexts. The step from attribute to individualizer (step 1) is associated with the loss of predicative contexts, that is, individualizer *several* only occurs as prenominal modifier. As a quantifier (step 2), *several* is further restricted to mainly indefinite plural NPs. The mechanism of change active in both steps was analyzed as semantic in nature. More particularly, Breban (2008, 2010: 102–109, 156–158, 188–191) argued that it involved the lexicalization of invited inferences (Traugott & König 1991) in ambiguous contexts (Diewald 2002; Heine 2002).

The case of *several* not only presents a two-step functional shift leftward (in the model of the English NP presented in Figure 1), towards more grammatical functions; it also shows the positional shifts predicted for these functions. More specifically, the sequence of functions given in Figure 1 above predicts, firstly, that the individualizer use of *several*, which functions as a secondary determiner, will follow any determiners or quantifiers, but cannot take up a position following an attribute. Secondly, it predicts that the quantifier *several* will either be placed immediately following a definite determiner, or in first position where it is the only determiner, i.e. in plural indefinite NPs. Present-day English data strongly support the predictions and the association of functions and positions in the NP model (see Breban 2010: 348–349).[2]

3. Developments of *various* and *numerous* (Breban 2014)

Breban (2014) compares the development of *several* with that of two other adjectives in Late Modern English, *various* and *numerous*, and shows that despite having the same functional input (attribute) and output (quantifier) the developments of the three adjectives are different.[3]

Numerous developed its quantifier use without ever functioning as individualizer, so there was a direct shift from attribute to quantifier. Breban (2014: 122–127) argued that this was possible because *numerous* underwent only a minimal semantic change; what did change was the nouns that *numerous* modified. As an attribute, *numerous* held the meaning 'vast, populous' and typically modified singular nouns with a collective meaning, as in (11).

(11) a very **numerous** garrison, of their bravest Janizaries (from the *Penn Parsed Corpus of Modern British English*, abbreviated as PPCMBE, 1700–1769)

[2] There are counterexamples, such as "I think it is part of a political effort to rehabilitate the president following **the disastrous several previous months**." (COCA, 1992). We thank one of the referees for this example. Placing the attribute *disastrous* in front of the quantifier engenders a particular effect: it explicitly restricts the scope of *disastrous* to these months only and places extra emphasis on *disastrous*.

[3] Due to space restrictions, this overview only focuses on the differences between the case studies. We refer the readers to Breban (2014) for a full discussion and more examples.

The change into quantifier was set in motion when the range of nouns started to expand to plural nouns with a collective meaning, e.g. *bees*, *troops*, and later into plural nouns denoting individual entities, e.g. *instances*, *points*, *trials*. The second stage of the expansion process was also identified as the locus for the shift from attribute to unspecific quantifier, as the new context, plural noun phrases denoting individual instances, is similar to that of unspecific quantifiers and incompatible with the original attribute meaning. The semantic change involves the re-conceptualization of the appreciation of vastness to counting instances as 'very many'. In the case of *numerous*, the driving force behind the grammaticalization is thus not semantic change but host-class expansion (Himmelmann 2004).

The adjective *various* did develop both an individualizer and a quantifier function, but interestingly, it did not do so in a two-step process, but rather developed both simultaneously and independently from the attribute function (Breban 2014: 116–122). Semantic change is the trigger for both developments. However, Breban argues that it is not invited inferencing that leads to a new possible interpretation and to ambiguity in certain contexts. On the contrary, the contexts in which the new grammatical meaning first appears are not contexts that support two meanings, but contexts that are underspecified and contain no clear clues as to which function *various* has. Examples in which the context favours the individualizer or the quantifier function are found only in later data.

4. The case of *multiple*

In this section, we present the results of our new corpus study of *multiple*, which shows how a function that was not in play for the adjectives described so far, that of classifier, plays a crucial role in the grammaticalization process. Table 1 gives an idea of the distribution of functions for *multiple* in Present-day English (a more detailed discussion can be found in Gentens 2012).The analysis is based on a random sample of 218 examples from COW (total number of hits: 12,546). As shown in Table 1, *multiple* is used as attribute (12), classifier (13), individualizer (14) and quantifier (15) in current English.

Table 1. Results of the functional analysis of the COW data

COW (PDE)	attr		class		class-quant		indiv		indiv-quant		quant	
	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl
predicative		1										
adnominal	7	2	54	15		4		28		14		93
218 (100%) 19.78(pmw)	10 (5%) 0.91		69 (32%) 6.26		4 (2%) 0.36		28 (13%) 2.54		14 (6%) 1.27		93 (43%) 8.44	

(12) To the question, "What kind of world do we have?" Hinduism answers: 1. A **multiple** world that includes innumerable galaxies horizontally, innumerable tiers vertically, and innumerable cycles temporally. (COW)

(13) DNA samples will be taken from offenders serving jail sentences of five years or more under a Federal Government proposal to build a national criminal database. The data would be cross-checked against evidence from unsolved crimes to track down **multiple** offenders. (COW)

(14) Unlike most roles, such as father, telephone lineman, or husband, 'the male role' … is thought of as a synthesis of the **multiple** roles men perform. (COW)

(15) In ancient times, when men had **multiple** wives, not all the wives had to bear children as long as at least one did. (COW)

The grammaticalized (unambiguous quantifier and individualizer uses) make up 55.5% of our data set, leaving a sizeable portion of attribute and especially classifier uses.

According to the OED (s.v. *multiple*, n. and adj.), *multiple* entered the English language as a borrowing. It suggests three different origins:

(i) French *multiple*, the usage of which is described as "1572 as noun in a mathematical sense; from the mid 18th cent. also as adjective in more general senses, but later than corresponding senses in English"

(ii) classical Latin *multiplex*, which has nominal and adjectival senses in the field of mathematics

(iii) a combination of the classical Latin stems *multi-* (bound morpheme meaning "more than one, many") and *-plus*, similar to *duplus* or English *duple*.

We aim to reconstruct the historical development of the different uses of *multiple* in English and how they interact with the different etymological sources. The data we used include consecutive samples from the *Corpus of Historical American English* (COHA, 1810–2009), where *multiple* was first attested in 1832. For the earlier data, we consulted several other corpora which yielded no or insufficient results: there were no relevant hits in the *Penn-Helsinki Parsed Corpus of Early Modern English* (1500–1710), of *Modern British English* (1700–1914), or in the *Old Bailey Corpus* (1720–1920) and too few and inadequately dispersed tokens in the *Corpus of Late Modern English Texts*, version 3.0 (1710–1920). For this reason, we resorted to the *Early English Books Online* (EEBO, 1473–1700) and *Oxford English Dictionary* quotations (OED) databases for the pre-1850 data. Because the latter type of data cannot be treated in the same way as the corpus data from COHA, we discuss them in separate sections.

4.1 1850–2009: data from COHA

The COHA data were used to trace the quantitative development of the different functions in the period 1850–2009. The data set includes all 90 instances in COHA for the period 1850–1910, and random samples of 100 instances from COHA for the periods 1910–1960 and 1960–2009.[4] We present the results in Table 2.

Table 2. Results of the functional analysis of the COHA data split up in COHA 1 (1850–1910), COHA 2 (1910–1960) and COHA 3 (1960–2009)

COHA 1	attr	class	class-	class-	indiv	indiv-	quant

[4] The total number of hits amounted to 569 for the period 1910–1960, and to 2498 for the period 1960–2009.

1850–1910					indiv		quant				quant			
	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl
predicative	3	3												
adnominal	9	1	43	11		2		1	1	1		9		6
90 (100%) 0.78 (pmw)	16 (17.78%) 0.14		54 (60%) 0.47		2 (2.22%) 0.02		1 (1.11%) 0.01		2 (2.22%) 0.02		9 (10%) 0.08		6 (6.67%) 0.05	

COHA 2 1910–1960	attr		class		class-indiv		class-quant		indiv		indiv-quant		quant	
	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl
predicative	2	3												
adnominal	9		33	22						1		9		21
100 (100%) 4.17 (pmw)	13 0.54		56 2.33						1 0.04		9 0.38		21 0.88	

COHA 3 1960–2009	attr		class		class-indiv		class-quant		indiv		indiv-quant		quant	
	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl	sg	pl
predicative														
adnominal	2	3	16	14						6		13		46
100 (100%) 18.75 (pmw)	5 0.94		30 5.62						6 1.12		13 2.44		46 8.62	

The data display a clear increase in the relative frequency of the quantifier function, from 6.67% to 46% (note that the figures for 1960–2009 are very similar to those of our COW data). There is also an increase in the relative frequency of the individualizer use, but this is situated in the transition from the

1910–1960 and 1960–2009 data sets. The COHA data hence illustrate how the grammaticalized quantifier and individualizer uses gain a stronger foothold, but the onset of their development has to be looked for in earlier data.

4.2 Before 1850: data from EEBO and OED

As explained earlier, we are using the EEBO and OED due to a lack of attestations for *multiple* in commonly used available corpora before 1850. The number of hits in these databases is small and we are aware that they do not have the same representativeness as the COHA data. For this reason, we will use raw numbers and focus on the qualitative analysis of the data. As is widely known, the OED is particularly good for finding early attestations of new senses; the data from EEBO provide additional insight into actual usage. We used the word *multiple* as query, and excluded identical tokens as well as those examples which featured the noun *multiple*, e.g. (16).

(16) If the **multiple** of the first exceed that of the second, the multiple of the third will also exceed that of the fourth. (OED, 1865 R. Williams tr. C. F. Milliet de Chales *Elem. Euclid* v. 209)

We will first discuss the findings from the OED data set. This set contained 38 examples, with the earliest one dating from 1642 and the latest one from 1850. After close inspection of the meaning and function of *multiple*, as well as of the genre of the texts the examples occurred in, we divided the examples into three groups.[5]

The first group consists of 17 examples in texts from the scientific domains of mostly Mathematics, but also some of Physics and Chemistry, in which *multiple* was used as a prenominal modifier with a meaning that was derived from its nominal use in the field of mathematics (OED sense A.2a "*Math.* A quantity which contains another quantity some number of times without remainder; a

[5] Both researchers analyzed all data independently and then put their analyses together to come to an agreed analysis.

quantity which is the product of a given quantity and some other, *esp.* one which results from multiplying the given quantity by an integer"), as in (17).

(17) 12 compared to 4 is **Multiple** Proportion, and named triple. (OED, 1705, E. Scarburgh *Eng. Euclide* 180 (*note*))

This use of *multiple* occurs with a restricted set of head nouns: *proportion*, as in (17), *ratio*, *arc*, *number*, *superpatient*, and *point*. The first example dates from 1704, which is later than the corresponding nominal use of *multiple* illustrated in (16). It links up with the first two etymological sources suggested by the OED (i.e. French *multiple* and Latin *multiplex*); the earliest examples are in fact translated texts or part of lexicons of mathematical terminology. The meaning of *multiple* in these examples is fixed and its use is restricted to these fields. It plays no role in the developments that we will discuss below.

The second group of examples have a lexical meaning which can be paraphrased as 'composite, consisting of several parts'. There are 19 examples of this kind. Interestingly, in several examples, *multiple* is contrasted with *double*, *triple* or *simple*, e.g. (18). The origin of this meaning hence appears to lie in the third etymological source suggested by the OED (*multi-* + *-plus*).

(18) The clusters of stars are sorted by their apparent compression, in the manner of my former catalogues of double, treble, and **multiple** stars. (OED, 1786, W. Herschel in *Philos. Trans.* (Royal Soc.) 76 466)

In terms of genre, these examples belong to a small specific range: law, sciences including biology, medicine, chemistry, astronomy) and philosophy, see Table 3. Because a number of examples contain the same head noun, Table 3 is organized by type, rather than by token.

Table 3. Analysis of OED examples with lexical meaning 'composite', ordered by head noun according to oldest occurrence

type (noun)	token frequency	dispersion	genre	analysis
poinding	2	2 texts (1642, 1753)	law (Scottish)	class
stomack	1	1 text (1676)	zoology	attr
echo/echoes	2	2 texts (1727, 1845)	natural science	class
antennae	1	1 text (1752)	zoology	attr
stars	3	3 texts (1782, 1786, 1848)	astronomy	1 attr (pred), 2 class
salt	1	1 text (1797)	chemistry	class
births	2	2 texts (1826, 1841)	medicine	class
bulb	1	1 text (1831)	botany	attr (pred)
matter	1	1 text (1839)	philosophy	attr
object	1	1 text (1839)	philosophy	attr
vision	1	1 text (1842)	medicine	attr (pred)
pedunculation	1	1 text (1847)	medicine	attr (pred)
fangs	1	1 text (1848)	zoology	attr (pred)
pregnancy	1	1 text (1850)	medicine	class

These examples all have the same lexical meaning. However, as shown in Table 3, this meaning is not associated with one function. Sometimes it is a property attributed to the referent and *multiple* functions as attribute, as in (19) (both prenominal and predicative construal are attested). However, in other examples, it derives a subtype, and *multiple* is analysed as classifier, as in (18) above. The presence and frequency of the classifier use is distinctive for *multiple* when compared to *several*, *various* and *numerous*.

(19) You may observe..the flattish heart, the Lungs,.. the penis, the **multiple** stomack &c. (OED, 1676 Sir T. Browne *Let.* 14 June in *Wks.* (1964) IV. 61)

Thirdly and finally, there are two examples in which *multiple* has the meaning 'many' and functions as quantifier, e.g. (20–21).

(20) It introduced two Reports instead of one, and **multuple** Attendances. (OED, 1742 R. North & M. North *Life F. North* 200)

(21) Doublets of fustian, under which lie **multiple** ruffs of cloth. (OED, 1834 T. Carlyle *Sartor Resartus* i. vii. 17/1)

If we compare their dates of first attestation, we can see that the quantifier use is later than the lexical uses, which corroborates a grammaticalization scenario. It can also be noted that the quantifier examples do not occur in texts of any of the genres listed earlier. The first example is part of a biography and the second is taken from a novel. We would expect this to be the case, as grammaticalized meanings are usually semantically more general than lexical ones.

Let us now turn to the EEBO data, which include 32 examples dating between 1620 and 1689. Two examples represent the fixed mathematical sense and will not be further discussed. The other 30 have the meaning 'composite'. These examples belong to a restricted range of genres, similar to those found in the OED data: science, law and, in addition, religion, see Table 4.What is striking is the large proportion of classifiers (26/30).

Table 4. Analysis of EEBO data excluding those with the fixed mathematical sense, ordered by head noun according to oldest occurrence

type (noun)	**token frequency**	**dispersion**	**genre**	**analysis**
believing	1	1 text (1620)	religion/philosophy	attr (pred)
poinding	17	5 texts (1642, 1681, 1683, 1684, 1686)	law (Scottish)	class
writing	3	1 text (1648)	science	class
reparation	1	1 text (1662)	law (English)	class

restitutions	3	1 text (1662)	law (English)	class
shells	4	1 text (1685)	biology	2 class/2 attr (pred)
yoke	1	1 text (1689)	religion	attr

So far, the data do not seem to differ significantly from the OED ones. However, they contain subtle cues which help explain how *multiple* developed its quantifier and individualizer functions. The explanation can be found in those examples that are 'formally' ambiguous between the different functions, i.e. those with plural NPs, and/or in which there are contextual elements that might trigger a new interpretation. Two examples which appear to capture the onset of the grammaticalization process are reproduced here as (22–23). Example (24) is added for purposes of comparison.

(22) Such and such persons: Note: [H] **Multiple** Poyndings. (EEBO, 1684)

(23) After all this, the Creditors go on in their **multiple** poinding, and being rank'd according to their due preference, the price is distributed amongst them accordingly (EEBO, 1686)

(24) he ought to have raised a Process of **multiple** poinding, calling the debitor and all the arresters or assigneys to dispute their several rights (EEBO, 1681)

An act of *poinding* refers to the legal procedure whereby a creditor claims his rights to another person's property or fund. *Multiple poinding* is the technical term employed when there are several claimants to the same property.[6] In examples such as (24), *multiple* can hence be paraphrased as composite poinding; a single process which affects several people. However, the plural form of the noun in (22) opens up the possibility of a second interpretation: individual or several processes of

[6] The referees pointed out that *multiple poinding* was written with a hyphen in one of the 17th century examples from EEBO and has its own entry in the OED. This suggests that *multiple poinding* might be a compound noun in certain texts/uses. We do not further investigate this question as the distinction between compound nouns and nominal phrases is notoriously difficult to make in English, as illustrated by this quote from Halliday (1994: 320):

> A sequence of Classifier + Thing may be so closely bonded that it is very like a single compound noun … the line between a compound noun and a nominal group consisting of Classifier + Thing is very fuzzy and shifting …

poinding, that is, an individualizer or a quantifier reading. The lack of context makes it impossible to determine the most appropriate reading among the three. In example (23), the use of *their* adds an element of plurality to the NP and the adjective *multiple* could be interpreted as an individualizer, equivalent to 'their separate poinding'. The rest of the sentence reinforces the idea of the creditors being dealt with individually. Another ambiguous phrase is *multiple restitutions*, as in (25).

(25) And why should not the solvent Thieves and Cheats be rather punished with **multiple** Restitutions then Death, Pillory, Whipping? &c. But it will be asked, with how manifold Restitutions should picking a pocket (for example) be punished? … wherefore to restore twenty-fold, that is, double to the hazard, is rather the true ratio and measure of punishment by double reparation. (EEBO, 1662)

In this example, *multiple* can be interpreted as having the lexical meaning 'composite' or the quantifier meaning 'several'. The OED (s.v. *multiple*, n. and adj.) analyses this example in the latter way as meaning 'many'. However, the lexical reading is supported by the mention of *double reparation*, which contains the related adjective *double* combined with a singular noun. In fact, the expression *multiple reparation* is used in the same text (see also Table 4). Note also that *manifold* in *manifold restitutions* displays the same ambiguity.

4.3 Hypotheses for the development of the grammaticalized uses

Based on examples such as (22), (23) and (25), we hypothesize that the grammaticalization process of *multiple* started with classifier examples in contexts that trigger semantic reanalysis: in plural NPs, (22) and (25), or in contexts which allow for a distributive reading, (23). Based on our examples, we can locate the start of this process in the middle of the 17th century. This confirms the OED's observation that English developed "more general" adjectival senses before French did in the 18th century. As for their further development, the first example of an unambiguous, fully-fledged quantifier use dates from 1742 in the data we looked at (see Section 4.1). The fact that this quantifier

example (as well as the second one in the OED) does not belong to one of the genres to which the lexical meaning appears to be confined provides evidence for productivity of the new function.

The first unambiguous individualizer examples can be found in the COHA data set, e.g. (26).

(26) a sovereign, a statesman, or a historian, can inscribe his words on a phonograph blank, which will then be multiplied a thousand-fold; each **multiple** copy will repeat the sounds of his voice thousands of times (COHA, 1887)

Compared to the quantifier function, the individualizer function is infrequent in the COHA and COW data. This can partly be explained by the fact that it is limited to specific contexts that warrant the use of an individualizer (see discussion of *several*), whereas the quantifier has no such restrictions. The considerable number of examples which we could not unambiguously assign to either the individualizer or the quantifier function also testify to the fact that in the absence of contextual clues the two interpretations are very close to each other.

4.4 Classifier uses of *multiple* in Modern and Present-day English

One final data-related observation pertains to the classifier uses of *multiple*. We proposed that the Modern English classifier examples (18, 24) had the meaning 'composite' and were therefore semantically related to attribute uses. Our distinguishing criterion was not meaning as such, but whether *multiple* denoted a subtype or merely described a feature of the referent. The classifier uses found in the COW data are not all a straight continuation from those found in Modern English. Some of the classifier uses have a different semantics. *A multiple offender* (see (13) above), for instance, is a type of offender who has committed a crime on various occasions, viz. a recidivist. Likewise, a *multiple gold medalist* is a contestant who has won multiple gold medals. In these examples, the content added by *multiple* is quantificational. Table 1 also provides a clue as to the origin of these new, semantically different, classifier uses. The figures include 4 examples we analyzed as ambiguous between a classifier and a quantifier reading, e.g. (27). In this example, *multiple* can refer to a specific type of fracture: a multiple fracture, which involves several fractures affecting the same bone, or, by

extension, the fracture of several bones as a result of the same injury. On a second reading of the example, however, it could also merely quantify an unspecified amount of fractures.

(27) Six of the injured were brought to St Vincent's in critical condition with head injuries, **multiple** fractures and severe burns. (COW)

In examples such as (27), it is unclear whether *multiple* functions as an independent quantifier or whether it should be considered as indicating a subtype of the type denoted by the noun. The fact that many of the *multiple* + noun combinations have become entrenched in usage and receive separate mention in the OED is an indication they constitute recognized subtypes. Pinpointing the earliest examples of this quantificational classifier use in our data proved tricky as several classifier examples allow for both a lexical ('composite') and a quantificational interpretation. For example, *multiple sclerosis* (first attestation OED 1877) is a *composite* type of sclerosis in that it is sclerosis that affects *several* different locations in the body. The first classifier examples in which a 'composite' reading is not possible, such as *multiple offender*, are found in our COW data. All in all then, our data show the development of individualizer and quantifier functions from the classifier function in Modern English followed by a 'countermovement' in the form of the formation of new classifier uses based on the quantifier meaning.

5. Discussion

In the previous sections, we described the developments of four unspecific quantifiers, *several*, *various*, *numerous*, on the basis of existing descriptions, and finally *multiple*, on the basis of a new corpus study. In this section, we assess to what extent the case study of *multiple* adds to our understanding of the development of quantifiers in Modern English, and to our understanding of change in the NP more generally.

In many respects, the development of *multiple* seems to resemble that of *various*. As was the case with *various*, individualizer and quantifier uses developed at the same time. The onset of the grammaticalization process was found in contexts that were formally ambiguous but semantically

underspecified for the quantifier use. As was found for *several* and *various*, the individualizer emerged in specific contexts, distributive ones, which we hypothesized 'invited' the reanalysis as individualizer. As regards the distinction between the step-wise development of *several* (from attribute over identifier to quantifier), and the simultaneous development of identifying and quantifying uses with *various*, Breban (2014: 128) offered the following explanation: the attribute meaning of *various*, 'varied, displaying variation' allowed invited inferencing of both the individualizer and the quantifier meaning, while the original meaning of *several*, 'distinctive, separate', did not. This argumentation for *various* could be extended to *multiple* and its lexical meaning 'composite'. The development involved semantic reinterpretation of this lexical meaning into two new grammatical meanings: from something that is composite and hence consists of more than one element to a focus on (i) the individual elements/instances or (ii) the description of the number of elements/instances. There is, however, one obvious difference between the case of *multiple* and the other quantifiers: it appears to be the classifier function, rather than the attribute function, which constituted the input for the development of the individualizer and quantifier functions. This difference has several important implications for our understanding of change in the English NP in general.

As far as we know, this is the first study to describe a process of grammaticalization with a classifier and not an attribute as input. Breban (2010: 34–35), further developing the proposals of Adamson (2000), suggests that the attribute function constitutes the source of both rightward and leftward development giving rise to new classifiers on the one hand and new (secondary) determiners/quantifiers on the other. The possibility of classifiers serving as input for grammaticalization processes is, however, not counterintuitive. The key to grammaticalization is that there is a semantic change from a function based on descriptive features to a grammatical function. Classifiers have a lexical, descriptive content (see Section 1), just like attributes. The essential difference is that in the classifier function this descriptive content is used to identify a subtype, whereas in the attribute function it describes a property of the individual referent. A plausible reason why there are more cases in which attributes serve as input for processes of grammaticalization is that attributes are more independent as modifiers, while classifiers have an undeniable link with the noun.

That is, subtypes are determined by the type (expressed by the noun), and classifier and noun typically constitute an established classification, and hence an entrenched combination.

The development from classifier to individualizer/quantifier has a second implication for the existing assumptions about changes in the English NP. Similar to the cases of grammaticalization described in the literature, these changes involve positional movement from right to left. Yet, the movement from classifier to individualizer and quantifier is different from other cases of grammaticalization in the NP in that it 'skips' one or two positions. That is, the positions associated with the classifier and the individualizer and quantifier respectively are non-adjacent. The existence of similar grammaticalization processes emphasizes that the factors making grammaticalization possible are found in actual usage rather than in theoretical models. As we said in Section 1, not all functions in the noun phrase have to be realized in actual usage. This means that in individual examples, structural ambiguity (with respect to position) can arise between non-adjacent functions if the intermediate functions are not realized. What is required for non-adjacent grammaticalization is that the frequency of examples of non-adjacent structural ambiguity is high enough to constitute a critical mass for functional reanalysis.

Let us turn to the opposite development, that from quantifier to classifier (Section 4.4). This development involves rightward movement in the NP and presents an obvious case of lexicalization, thus conforming to Adamson's (2000) hypothesis. One aspect of the shift that is surprising is once more the fact that the two functions serving as input and output of the process are non-adjacent. In this case, however, the process of change itself can offer an explanation. The semantic processes underlying lexicalization in the NP have not been studied in the same way as those involved in grammaticalization. The following observations are therefore only tentative. The new quantificational classifier uses are not created via semantic ambiguity in specific contexts, but appear to be more 'intentional'. They involve the creation of a novel prenominal type description expressing the meaning of a syntactically more complex construction, e.g. *a multiple offender* as 'someone who commits multiple offences', in which *multiple* has the function of quantifier. *Multiple* acts as the trigger for the addressee to reconstruct this complex meaning. It seems that classifiers are in this way different from attributes which always stand in a relationship of predication with the referent, e.g. *a blue ball* is 'a

ball that is blue'. Understanding what *multiple* (or any other classifier) means is only possible if the complex meaning is known by/accessible to the addressee. Sometimes this relation is one of property, as for the classifier examples with *multiple* in Modern English, but it does not have to be. The larger number of possible relations also helps to understand why items of different grammatical word classes can be used as classifiers (e.g. nouns, adjectives, quantifiers).

At face value, our study shows consecutive countermovements with a first development away from classifier (to individualizer and quantifier) and a later one towards a new classifier use. This might appear particularly odd in the light of the emphasis on paths and directionalities of change. It seems to us that what is key here is the nature of the second development. Firstly, it is not a reversal of the original grammaticalization process because the output classifier uses has a different meaning. Secondly, the process of semantic change involved in *multiple*'s shift from quantifier to classifier is very different.

6. Conclusion

In this paper, we have shown how the case study of *multiple* differed from those of other new quantifiers. The individuality of the developments of all four quantifiers highlights that detailed corpus studies of historical data are useful for understanding the variety of processes and mechanisms of change involved in grammaticalization. While the general, abstract characteristics of grammaticalization are no longer a topic of debate, the more fine-grained observations from case studies appear to be the means of advancing the understanding and modeling of change. The case study of *multiple* has allowed us to nuance several assumptions about grammaticalization and lexicalization in the English noun phrase. Firstly, classifiers can serve as input for grammaticalization. Secondly, grammaticalization and lexicalization processes can have non-adjacent functions as their input and output. Finally, one thing that has become absolutely clear from our discussion is that the development of classifiers and developments taking classifiers as their input are not sufficiently understood and constitute interesting topics for further research.

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