

ANALYSING A TYPE OF COLLOCATION: *MAKE* COMPLEX PREDICATES IN NINETEENTH-CENTURY SCIENCE AND FICTION¹

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ABSTRACT

The aim of this paper is to analyse the behaviour of a type of collocation formed by a verb plus noun in 19th-century texts. The study will be focused on the verb *make* when functioning as a collocative or light verb. In order to check if the register or text-type determines in some way the use of these collocations, the corpus used will have two separate parts. The scientific subcorpus will include extracts of the *Coruña Corpus of English Scientific Writing*, and the 19th-century fiction section will be compiled with literary texts taken from the *Chadwyck-Healey Collection*. As the *Chadwyck-Healey Collection* is not a corpus but a database, excerpts of some of the novels included there have been selected to compile an appropriate counterpart.

KEY WORDS: Collocation, complex predicate, light verb, scientific discourse, corpus linguistics, historical linguistics, *make*.

RESUMEN

El propósito de este trabajo es analizar el comportamiento de un tipo de colocación formada con el verbo *make* más un nombre en textos del siglo XIX. El estudio se centrará en el verbo *make* cuando funcione como colocativo o verbo *light*. Para comprobar si el registro o tipo de texto condiciona de alguna manera el uso de estas colocaciones, el corpus utilizado tendrá dos partes diferenciadas. El subcorpus científico incluirá textos que formarán parte del *Coruña Corpus of English Scientific Writing* y el subcorpus de ficción se compilará con textos literarios extraídos de la *Chadwyck-Healey Collection*. Como la *Chadwyck-Healey Collection* no es un corpus en sí mismo sino una base de datos, se han seleccionado fragmentos de algunas de sus novelas para compilar un subcorpus de ficción adecuado.

PALABRAS CLAVE: colocación, predicado complejo, verbo *light*, discurso científico, lingüística de corpus, lingüística histórica, *make*.

1. INTRODUCTION

The aim of this pilot-study is to analyse one type of collocation formed by the verb *make* plus a noun in 19th-century texts. Following the research line opened

in Lareo (2008) on 19th-century collocations in general and Lareo and Esteve-Ramos on 18th-century complex predicates, I will focus my attention on the latter type for the sake of a future comparison.

In order to confirm the assumption that register conditions the use of these collocations and explore how it affects them, extracts from two different corpora were selected for this study: the *Coruña Corpus of English Scientific Writing (CC)* for scientific texts and samples of the *Chadwyck-Healey Collection* for 19th-century fiction. As the *CC* is an ongoing project no general conclusions can be offered. However, the partial results showed here can be of great interest for a future comparison.

The concept of *register* here is in accordance with Lee's definition (Lee 46): "Register is used when we view a text as language: the instantiation of a conventionalized, functional configuration of language tied to certain broad societal situations, that is, variety according to use." It is in this sense that this study will be dealing with the 19th-century scientific and literary registers. These two registers are different enough to be compared, the former representing the language used by scientists who address a specialised audience (using normally specific² or technical vocabulary).

Although the term 'collocation' covers a wide range of structures, this paper focuses on one type of collocation only: the verb *make*, as collocative/collocate or light verb, in combination with nouns which semantically resemble what is expressed by an etymologically related verb, or, as Cattell (Cattell 43) calls them, *complex predicates*. Examples (1) and (2) illustrate these cases:

- (1) He **made**, accordingly, numerous **observations** upon its position, which, although rude, compared with the present standard of accuracy... (Olmsted 1841).
- (2) [...] but the **calculations** must be **made** by the tedious processes of multiplication and division (Day 1815).

Selecting the verb *make* for comparison between scientific and fiction texts was a decision based not only on Biber *et al.*'s statement (Biber *et al.* 1028) about the extensive use of phrases with the verbs *have*, *make*, and *take* in written registers, mentioning academic prose in particular; but also on the results obtained from previous corpus-based studies of the collocational aspects of verbs by Claridge, Hiltunen, Kytö and Matsumoto in which *make* has the highest frequency, as displayed in Table 1.

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² This term is used by Sager, Dungworth and McDonald (SAGER, DUNGWORTH and McDONALD 182) to cover English for Special Purposes (ESP) as well as the English of Science and Technology (EST).

TABLE 1: RESULTS OF PREVIOUS STUDIES.

Period	ME	eModE		
Authors	Matsumoto	Kytö	Hiltunen	Claridge ^a
Dates	1100-1500	1500-1710	1580-1680	1640-1740
Corpus	<i>ME</i> and <i>OE</i> dictionaries, Malory, Chaucer	<i>Helsinki Corpus</i>	40 dramatic ^b works, 14 poems, 6 prose	<i>Lampeter Corpus</i>
Words		551,000	1,100,000	1,772,102
Tokens	1,950	2,056	1,851	1,579
Types	990	675	625	250
Verb classification by number of types	<i>Maken</i> <i>Taken</i> <i>Hauen</i> <i>Don</i> <i>Yeven</i>	<i>Make</i> <i>Have</i> <i>Give</i> <i>Take</i> <i>Do</i>	<i>Make</i> <i>Have</i> <i>Give</i> <i>Take</i> <i>Do</i>	<i>Make</i> <i>Give</i> <i>Take</i> <i>Have</i> <i>Do</i>
Verb classification by number of tokens		<i>Make</i> <i>Have</i> <i>Give</i> <i>Take</i> <i>Do</i>	<i>Have</i> <i>Take</i> <i>Give</i> <i>Make</i> <i>Do</i>	<i>Make</i> <i>Take</i> <i>Give</i> <i>Have</i> <i>Do</i>

^a Only groups I and II of Claridge's "verbo-nominal combinations" in which the verbs *make*, *have*, *take*, *do* and *give* are involved in a collocation were taken into account for the totals. These two groups differ only in the compulsory use of an object that must be attached to the nominal part with the help of a preposition. Claridge includes, as members of group I, "simple verb-noun units" such as *take a walk*, *make a resolution*, *do harm*, whereas group II is formed by "verb-noun-preposition units" such as *make use of*, *take care of*, *give account of* (CLARIDGE 40, 69-81).

^b The material consists of twenty plays by Shakespeare and the *Sonnets*, eleven texts by Marlowe, eight by Middleton, five editions of Webster's works, three plays by Johnson, two by Marston, two texts by Sidney and single items by Behn, Cowley, Donne, Dryden, Marvell, Milton, Spenser and Udall (HILTUNEN 135).

The structure of this paper is as follows. Section 2 is devoted to the composition of the corpus used for this study. As the scientific texts selected belong to the *CC*, the criteria used for its compilation and the end product are described in this section. Some details about the fiction texts are also given. Section 3 focuses on the selection criteria, methodology and presentation of overall data. Finally, the last section offers a data analysis in the following manner: in 4.1 the number of types and tokens is evaluated, and conclusions are arrived at as to their different usage in both registers (science and fiction); furthermore, aspects such as their supposed colloquial character are reconsidered; in 4.2 the morphological processes affecting the nouns extracted from the corpus are exposed; and, finally, in 4.3, some concluding observations are made concerning the comparison between related verbs and complex predicate frequencies.



2. COMPOSITION OF THE CORPUS

The corpus under survey, formed of science and fiction texts, has two balanced blocks, one devoted to science and the other to fiction. For each of these blocks, samples of comparable dates totalling 100,000 words were included. The scientific block is equally divided among the disciplines chosen, that is, 50,000 words for Mathematics and 50,000 for Astronomy. Altogether, the corpus searched here contains 200,000 words (see Table 2). Taking into account Biber's statement (Biber 249) about the adequate length of samples included in a corpus, I consider that this corpus achieves enough representativeness.

The scientific texts relating to the Mathematics and Astronomy disciplines are included in the *CC*. The *CC* is a collection of English scientific texts published between 1650 and 1900 that is being compiled by the Research Group for Multidimensional Corpus-based Studies in English (MuStE) at A Coruña University (Spain). The decisions made by the team to structure and organise the corpus have involved both theoretical and practical considerations (see Lareo; Lareo and Esteve-Ramos; Moskowich and Crespo).

The Modern English section, what has been compiled up to now, is comprised of texts written in English by English-speaking authors. The option of including only one text per author was preferred, when possible, in order to increase the representativeness of idiolectal variants, thus following some of the compilation principles used in the *Lampeter Corpus of Early Modern English Tracts*. Although some preferences, such as the exclusion of translations and the selection of first editions —when available— have made the search more difficult, they were followed to strengthen the *CC*'s representativeness and accuracy for the period under survey. The aim of our team is to examine and explore the corpus possibilities for analysis in the morphological, syntactic and semantic fields. In this sense, this paper is a pilot-study, investigating *make* complex predicates in this sub-corpus.

The fiction corpus also contains 100,000 words, taken from works of four male authors published at approximately the same time as the scientific counterparts (the list of texts surveyed and details are included in Table 2 and Appendix 1). The decision to analyse only texts written by men was made due to the results obtained in a previous study about collocations in Late Modern English using a fiction corpus also compiled from the *Chadwyck-Healey Collection*. In that study (Lareo 2006) the corpus had two balanced blocks of texts, those written only by men and the others by women writers. The results of that analysis of the use of collocations for a fiction corpus revealed a difference in frequency for gender. Consequently, only works written by male authors were included for this analysis to avoid any distortion in the results.

TABLE 2: CORPUS DETAILS.

SCIENCE ASTRONOMY			MATHEMATICS			FICTION FICTION		
Date	Author	Words	Date	Author	Words	Date	Author	Words
1809	Ewing	9,596	1811	Barlow	8,099			
1811	Brewster	5,062	1815	Day	13,084	1814	Scott	25,000
1841	Olmsted	8,980	1842	O'Brien	8,900	1840	Thackeray	25,000
1860	Mitchel	9,853	1863	Townsend	9,729	1860	Collins	25,000
1893	Searle	7,916	1893	Byerly	10,188	1892	Doyle	25,000
1895	Lowell	8,593						
Words		50,000	Words		50,000	Words		100,000

3. SELECTION AND PROCESSING OF DATA

Since the sample frames are restricted to the 19th-century, the *make* complex predicates studied would be expected to fulfil the requirements of that time for being considered complex predicates. To this end the *OED ver.3* (about this version see Simpson, Weiner and Durkin) was used as core information. Thus, the examples in my corpora for which the *OED* does not offer any proof of the existence of an etymologically and semantically related verb, still in use at that time, were excluded from this research (see examples (3)-(5)). These principles are meant to help obtain a representative set of data and thereby a reliable picture of the use of these collocations by the scientists and men of literature of the period under scrutiny. In addition, such a set of data enables the comparison between the frequency of the complex predicates and related verbs.

- (3) [...] many rays are refracted into the shadow, especially those of a red colour, which have the greatest momentum, and **make** their way through it, while others are turned off in other directions (Ewing 1809).
- (4) In case the **effort** were now **made** to predict a solar eclipse (Mitchel 1860).
- (5) "I think that this typewritten letter is from you, in which you **made** an **appointment** with me for six o'clock?" (Doyle 1892).

These and similar collocations were excluded because they failed to meet the selection requirement. The study is focused on collocations that have a related and 'interchangeable' verb still in use in the period studied. As Cattell, Dirven, Dixon Gläser and Stein have pointed out, it does not imply that they can always be interchanged due to the specific grammatical and semantical possibilities each one of them offers.

Table 3 displays the information on the use of the verbs related to examples (3) and (5) included in the *OED*. The last column shows that these verbs were in use only until the 18th-century. The second column, likewise, shows that the supposedly related verb for example (4) does not have the same meaning as the complex predicate.

TABLE 3: OED INFORMATION.			
VERB	MEANING	FIRST EVIDENCE	LAST EVIDENCE
Way <i>v.</i> 1. <i>intr.</i>	To go, journey, proceed	1596	1708
Effort <i>v.</i> 1.	To strengthen, fortify	1662	1662
Appoint <i>v.</i> 3. <i>trans</i>	To make an appointment for a meeting with (a person)	1528	1797

All occurrences of the verb *make* were counted in both corpora to later separate the examples in which this verb functions as part of a complex predicate. It is not possible to mechanically search for this type of construction; therefore, the examples—although located by the *Text Search* program version 2.4 (see Alcott)—are the result of my readings.

The data set out below show that this function of *make* is more often found in science than in fiction (see Table 4). This seems to contradict the widespread opinion regarding the colloquial character of these analytical phrases held, for instance, by Curme, Dirven, Dixon, Hiltunen, Poutsma and Wierzbicka. On the contrary, they seem to corroborate the point of view of authors such as Gledhill, Kytö, Lareo (2008), Nickel (Nickel 2), Stein (Stein 8, 26) and Wotjak (Wotjak 267), concerning their increasingly frequent use in all types of texts, including scientific ones. Also, Koike (Koike 197) in her work about collocations in Present Spanish points out that collocations can be used within different registers (formal, informal, speech, writing, etc.). In her opinion, the selected collocative (in this case the verb that precedes the noun) could have certain stylistic implications. Nevertheless, the Spanish common or general verbs, such as *hacer*, *dar*, *tomar*, etc., that function as the English verbs *make*, *have*, *take*, *do* and *give* are considered by the author to be part of the neutral linguistic level, or devoid of stylistic implications (see also Alonso 104). That is, the production of collocations with general collocative verbs such as the one I deal with in this paper—*make*—is not restricted to any kind of register, style, or linguistic production. For instance, in collocations such as those of examples (6) and (7) the choice of the verbs *give* and *do* represents the neutral level. Nevertheless, the verbs of examples (8) and (9)—two further samples of the verbal possibilities these collocations offer—imply a change of style. In this case, the second option implies a change from the neutral to the colloquial level.

- (6) *to give a kiss on one's mouth*
- (7) *to do a paper on ...*
- (8) *to plant a kiss on one's mouth*
- (9) *to whip up a paper on ...*

The data shown in Table 4 are organised in the following way: the first two columns are devoted to each section of the corpora compiled (science and fiction). The science column shows the results obtained in both sections of the corpus (Astronomy and Mathematics). Finally, each section includes the date in which the text was published, the number of tokens found (#), the number of words taken from each text (words) and the normalised figures per 1,000 words (NF).

TABLE 4: PERCENTAGES OF MAKE COMPLEX PREDICATES IN EACH TEXT

SCIENCE			MATHEMATICS			FICTION		
ASTRONOMY						FICTION		
Date	# / words	NF	Date	# / words	NF	Date	# / words	NF
1809	5 / 9,596	0.52	1811	3 / 8,099	0.37			
1811	2 / 5,052	0.39	1815	18 / 13,084	1.37	1814	15 / 25,000	0.60
1841	10 / 8,980	1.11	1842	8 / 8,900	0.89	1840	26 / 25,000	1.04
1860	12 / 9,853	1.21	1863	0 / 9,729	0	1860	17 / 25,000	0.68
1893	20 / 7,926	2.52	1893	1 / 10,188	0.09	1892	16 / 25,000	0.64
1895	6 / 8,593	0.69						
Total	55 / 50,000	1.10	Total	30 / 50,000	0.60			
Total	85 / 100,000				0.85	Total	74 / 100,000	0.74

4. ANALYSIS OF RESULTS

4.1. TYPES VERSUS TOKENS

Applying the same criteria as the ones followed in previous studies on this topic, the results obtained have been divided into two different categories: types and tokens. On the one hand, the label *type* is used for the coapartition of the verb *make* and a noun counting only the different complex predicate but not the examples found. On the other hand, the label *token* refers to the total amount of examples extracted from the corpus. For instance *make+advance*, *make+change*, *make+apology*, etc. are three different types of complex predicates but the corresponding number of tokens is 10 (3, 2 and 6) as displayed in Table 5.

The data provided above show that the tokens or the total occurrences for science outnumber those for fiction. This result does not seem to corroborate either

Renský's view of a 'comparable' use of this type of analytical phrases between scientific registers and others, or the aforementioned widespread opinion of the colloquial character of these collocations. However, the analysis of the science corpus in itself shows a striking difference between the disciplines tested. Whereas in the Astronomy block the use of *make* complex predicates reaches 55 tokens (NF 1.1), the number of tokens in the Mathematics block decreases considerably to almost half this figure, with only 30 tokens (NF 0.6%). Consequently, there seems to be a relation between the discipline surveyed and the use of complex predicates. This idea seems also to be shared by Gledhill (Gledhill 205) in relation to the research article. He declares that "the research article genre does not have a single monolithic style, with entirely predictable features. The sheer variety of graphic presentation from one research specialism to another is a useful reminder of the complexity and heterogeneous nature of scientific discourse." Nevertheless, as the aim of this paper is to compare science and fiction, the science corpus has been taken as a whole for this purpose.

Using complex predicates instead of the related verb seems to have been connected with the use of high-frequency nouns in the 19th-century. Bailey (Bailey 229) affirms that it was not until the end of that century when "using nouns instead of available verbs, at least sometimes, was socially threatening." He explains that using nouns, for instance in phrases such as *have a look* instead of the verb *to look*, was a sign of the modern. But in the case of science, nominalizations were not only a sign of the modern but also a way to express and experience science. This idea is perfectly articulated by Halliday and Martin:

The prototypical meaning of a noun is an object; when **stable**, **behave**, **occur**, **develop**, **use**, are regrammaticized as **stability**, **behaviour**, **occurrence**, **development**, **utility** they take on the semantic flavour of objects, on the model of the abstract objects of a technical taxonomy like **radiation**, **equation** and **mass**. Isolated instances of this would by themselves have little significance; but when it happens on massive scale the effect is to reconstrue the nature of experience as a whole. [...] the elaborated register of scientific knowledge reconstrues reality as an edifice of things. It holds reality still, to be kept under observation and experimented with; and in so doing, interprets it not as changing with time [...] but as persisting—or rather, persistence—through time, which is the mode of being of a noun. (Halliday and Martin 15).

This property of scientific discourse, evidenced again by Halliday, is directly related to the nouns involved in complex predicates because, although being presented as objects, they are, in fact, processes. However, as nouns, they have a morphological relation to the verb. From this point of view and to open new directions for my analysis for the following point (4.2), the nouns of our complex predicates have been classified according to the process undergone either by the related verb or by the noun itself. Nouns were separated into isomorphic ones (conversion), when the *OED* offers an homographic and related verb, and non-isomorphic ones (derivation), when a suffix is needed. In Table 5 types and tokens found in both corpora are displayed.

The notation added to some nouns such as *proposal1.2b* or *proposal1.3a* identifies different senses specified in the *OED* (*s.v. proposal n.*):

proposal1.2b: spec. An offer of marriage.

proposal1.3a: The action, or usually (now always) an act, of proposing something to be done; an offer to do something; a scheme or plan of action proposed.

This notation refers to the windows used by the Cd-version of the dictionary to display the information. Number 1 identifies the first noun in the 'list of words' window and the number and letter after the period are taken from the senses included in the right window.

TABLE 5: CORPORA RESULTS.

SCIENCE				FICTION			
Isomorphic (conversion)		Non-isomorphic (derivation)		Isomorphic (conversion)		Non-isomorphic (derivation)	
Type	#	Type	#	Type	#	Type	#
advance	3	Addition	4	advance	1	acknowledgment	1
change	2	Alteration	1	appeal	1	apology	6
chart	1	Appearance	3	attack	1	appearance	2
Loop	1	Application	1	attempt	7	arrangement	2
Map	1	Calculation	7	bow	3	avowal	1
mark	2	Computation	3	campaign	1	confession	2
photograph	2	Comparison	1	copy	1	discovery	1
progress	1	Contribution	3	doubt	1	drawing	1
promise	1	Development	1	escape	2	entrance	1
record	1	Discovery	6	excuse	1	impression	2
remark	4	Division	1	fight	2	inquiry	3
research	1	Examination	2	joke	1	mystery	1
scale	1	Explanation	1	love	5	objection	1
Use	4	Investigation	1	mistake	1	oration	1
		Movement	2	note	1	proposal.2b	1
		Observation	8	peace	1	proposal.3a	1
		Prediction	1	progress	3	proposition	1
		Revolution	2	reply	2	selection	1
		simplification	1	salute	1	statement.2a	1
		Solution	1	signal	2		
		Substitution	2	speech	4		
		Subtraction	3	study	1		
		Suggestion	1	visit	1		
		Supposition	1				
		statement.1a	1			1	
		statement.2a	1			2	

Partial conclusions can be reached from these data. Both corpora made similar use of *make* complex predicate types (40 in science and 42 in fiction). This tendency is broken with regard to tokens (as it is displayed in the last row of Table 4, 85 were found in science and 74 in fiction). A possible explanation of this result could be the aim of scientific discourse to make things clearer. In order to explain important concepts and to hold the reader's attention, the authors studied write nouns and sometimes repeat them within the same text; it is then that, despite the supposed colloquial character of these collocations, the instances in science outnumber the ones in fiction. The normalised figures per 1,000 words (0.85 in science and 0.74 in fiction) also imply a tendency of these samples of scientific discourse toward repetition. The use of repetition of scientific writings, observed by Moskowich and Sager *et al.* (Sager, Dungworth and McDonald 238), may reveal a more didactic style of the samples searched. The language is only used as a vehicle to convey information, being the aim of these writings to focus the attention of the reader on the topic and not on the language itself. On the other hand, the higher number of tokens in science confirms Halliday's opinion that nominalization in scientific writing is important for picking up the preceding argument and presenting the objectified form as something to be taken for granted (Halliday 98).

4.2. THE NOUNS AND THEIR MORPHOLOGICAL PROCESSES

As the samples included in Table 5 reveal, the morphological processes adopted by these nouns —conversion and derivation— yielded different results depending on register (these data are displayed in Table 6). In science most tokens of the nouns involved in complex predicates are derivatives (70.6% vs 29.4%), whereas in fiction the difference is not as striking (40.5% vs 59.4%). The comparison of these results shows that while scientific texts select derivative nouns to form complex predicates, fiction prefers isomorphic ones. This result coincides with the abundance of derivation observed by Sánchez in his study about derivation and compounding in Modern English scientific writing. On the contrary, Hiltunen (Hiltunen 151), in the fiction corpus-based study (see note 4) he carried out on what he calls 'verbal phrases', pointed out that the nouns that collocate with this verb were mainly derivatives in the EModE period. But his observations do not coincide with Kytö's (Kytö 174) for the same period and with the *Helsinki Corpus*. She concludes that the nouns recorded in her study were predominantly isomorphic, as is the case in the fiction samples. Conversely, in the science corpus derivation is by far more common for both types and tokens (63.4% and 70.6%). The occurrence of derivation in scientific writing is explained by Halliday and Martin (Halliday and Martin 12) as a resource of the genre established by Greek scientists and later transferred by calquing into Latin. Evidently, English, as the scientific language par excellence, has inherited this feature.

The suffix most frequently found in this corpus is *-ion* (see Table 5), as in Hiltunen's study. This was expected since this suffix is added to form abstract nouns to designate a process (Sager, Dungworth and McDonald 276), precisely one of the tasks developed by the nouns involved in complex predicates.

TABLE 6: MORPHOLOGICAL PROCESS RESULTS

	SCIENCE (types 40; tokens 85)				FICTION (types 42; tokens 74)			
	Conversion	%	Derivation	%	Conversion	%	Derivation	%
TYPES	14	35	26	63.4	23	54.7	19	45.2
TOKENS	25	29.4	60	70.6	44	59.4	30	40.5

4.3. VERB VERSUS COMPLEX PREDICATE

That scientific texts typically exhibit an exceptionally high proportion of nouns in relation to verbs due to scientists' greater emphasis on ideas and not actions has been pointed out by authors such as Crespo and Moskowich, Halliday, Huddleston, Moskowich and Crespo, and Sager, Dungworth and McDonald. In this line, I have focused my attention on complex predicates, constructions in which nouns are involved. But even though the use of these collocations in scientific writing has been verified in this paper, the last step will be to compare the use of complex predicates and the "corresponding" verbs. Nickel's (Nickel 2) statement about the "marked tendency in modern English, scientific as well as colloquial, to use complex verbal structures in place of simple verbs" has also driven me to do a new search. Consequently, all semantically and etymologically related verbs were examined to observe the tendency followed by these texts. Examples such as (10-13) were studied. For instance, examples (10) and (12) contain two occurrences of some verbs related to the complex predicates included in (11) and (13). To be precise, the collocation displayed in (11) was found only twice in the science corpus, whereas the verb in (10) was used seventeen times. Likewise, the common collocation in (13) was found only four times, whereas the corresponding verb appeared ten times.

- (10) **When they are substituted in equation [...]** it will hold good at the [...] points of the unit sphere [...] (Byerly 1893).
- (11) **Making** the first **substitution**, we find [...] not Legendre's Equation but a somewhat more general form. (Byerly 1893).
- (12) In the first place we may **remark** that the sign here, as well as elsewhere, always signifies actual equality; (O'Brien 1842).
- (13) It will be necessary to **make** a few preliminary **remarks** on the nature of an ordinary series of the form [...] (O'Brien 1842).

In contrast to Nickel's opinion, the findings of my search show a striking difference in the use of collocation and related verbs for both genres. Whereas in the 100,000 word science corpus 85 tokens of complex predicates (NF 0.85) to

563 occurrences of the corresponding verbs were found (NF 5.63), in the 100,000 word fiction corpus the figures are not so disparate (74 (NF 0.74) to 223 (NF 2.23)). This result is explainable taking into account the aim and features of scientific writings, namely, to describe how the results were achieved using a language more concise and precise than the language of fiction. In this sense, the advantages collocations offer—allowing for more flexibility in the strict word order of English and for more syntactic possibilities—seem not to be as necessary for scientific register. Thus, although more occurrences of *make* complex predicates were found in science, showing that this is also a linguistic device of 19th-century scientific English, the data obtained from this last search show scientists' preference for verbs.

Finally, I intended to examine whether the old rivalry between *make* and *do* arising in late Old English (Akimoto and Brinton) continues to this period. To this end, the nouns involved in *make* complex predicates were the focus of a minute study, where a search was conducted for possible combinations of those nouns with the light verb *do*. Although this duality was still observable in 19th-century fiction (Lareo 2006), the coexistence of both verbs with the same noun in scientific writing is not confirmed by my data, supporting in this way the results of previous studies.

5. CONCLUSION

This study of *make* complex predicates using a balanced corpus of science and fiction samples in the Modern English period has shown an evident use of these periphrastic constructions for the period, surprisingly greater for science than for fiction. Therefore, in view of the evidence, I agree with Kytö (Kytö 178), who has observed a frequent use of, in her case, composite predicates in informal as well as in formal writing. The fact that in this research the number of tokens found in scientific writing is higher than that found in fiction, the latter being supposedly more informal, provides support for this claim. Claridge (Claridge 197) has also obtained results that support the same view. She thinks that composite predicates, “or the majority of them, might be part of a stylistically rather neutral level of the language,” as seems to be the case for scientific writing.

My results for the morphological process followed by the nouns involved in these complex predicates sustain Sager *et al.*'s opinion (Sager, Dungworth and McDonald 276) concerning the use of conversion in scientific writing. They point out that “conversion is less productive in scientific English because of the high proportion of terms derived from Latin and Greek word elements with identifiable noun endings which are therefore not suitable for conversion.”

Finally, the survey of the use of related verbs instead of complex predicates has shown that although 19th-century scientists employed this type of collocation, they did not prefer complex predicates to simple related verbs. This is also the result for the fiction corpus data, but the difference is not as striking. The result obtained on the scientific texts search could be explained taking into account that most of them show a didactic style. In those cases the writings are very strong on demonstrating or making the argument evident by reasoning or practical proof, explain-

ing clearly every step taken to solve a problem. The use of verbs in this type of writings conveys a more authoritative or reliable character.

I would like to recall the suggestion made in the first part of this paper about the new directions for further investigation opened by the research done on the science corpus. The different results found in the science corpus suggest that a study based on a wider range of disciplines like the ones now being compiled in the *Coruña Corpus of English Scientific Writing* (History, Life Sciences, Philosophy and Physics) could produce different results with regard to *make* complex predicates. Moreover, not only discipline, but also the metadata about the authors (their origin, education, sex) and about the texts (text-type, number of editions, etc.) that will be added to the CC could produce interesting results regarding the use of this type of collocation in English scientific writing.

APPENDIX

FICTION

COLLINS, Wilkie. *The Woman in White*. London: Sampsonlow, 1860.

DOYLE, Sir Arthur C. *The Adventures of Sherlock Holmes*. New York: Harper, 1892.

SCOTT, Sir Walter. *Waverley*. Edinburg: Robert Cadell, 1814.

THACKERAY, William M. *Catherine*. London: James Fraser, 1840.

SCIENCE

Mathematics

BARLOW, Peter. *An Elementary Investigation of the Theory of Numbers, with Its Application to the Indeterminate and Diophantine Analysis, the Analytical and Geometrical Division of the Circle, and Several Other Curious Algebraical and Arithmetical Problems*. London: Johnson, 1811. 7-51.

BYERLY, William E. *An Elementary Treatise on Fourier's Series and Spherical, Cylindrical, and Ellipsoidal Harmonics with Applications to Problems in Mathematical Physics*. Boston: Ginn, 1893. 144-216.

DAY, Jeremiah. *A Treatise of Plane Trigonometry: To Which Is Prefixed, a Summary View of the Nature and Use of Logarithms. Being the Second Part of a Course of Mathematics, Adapted to the Method of Instruction in the American Colleges*. New Haven: Howe, 1815. 1-61.

O'BRIEN, Rev. Matthew. *An Elementary Treatise on the Differential Calculus, in Which the Method of Limits Exclusively Made Use Of*. Cambridge: Deighton, 1842. 77-126.



Townsend, Rev. Richard. *Chapters on the Modern Geometry of the Point, Line, and Circle: Being the Substance of Lectures Delivered in the University of Dublin to the Candidates for Honors of the First Year in Arts*. Dublin: Hodges, 1863. 144-175.

Astronomy

- BREWSTER, Sir David. *Ferguson's Astronomy Explained upon Sir Isaac Newton's Principles: With Notes and Supplementary Chapters*. Philadelphia: A. Small, 1811. 265-284.
- EWING, John. *A Plain Elementary and Practical System of Natural Experimental Philosophy: Including Astronomy and Chronology*. Philadelphia: Hopkins, 1809. 492-523.
- LOWELL, Percival. "Mars III: Canals." *The Atlantic Monthly* 76 (July 1895): 106-109.
- MITCHEL, O.M. *Popular Astronomy: A Concise Elementary Treatise on the Sun, Planets, Satellites and Comets*. New York: Blakeman, 1860. 15-69.
- OLMSTED, Denison. *Letters on Astronomy: Addressed to a Lady in Which the Elements of the Science Are Familiarly Explained in Connexion with Its Literary History*. New York: Harper, 1841.
- Searle, Rev. George M. "Recent Discoveries in Astronomy." *Catholic World* 57.338 (May 1893): 164-181.

WORKS CITED

- AKIMOTO, Minoji. "Collocations and Idioms in Late Modern English." *Collocational and Idiomatic Aspects of Composite Predicates in the History of English*. Ed. L. Brinton and M. Akimoto. Amsterdam: John Benjamins, 1999. 207-238.
- AKIMOTO, Minoji and Laurel J. BRINTON. "The Origin of the Composite Predicates in Old English." *Collocational and Idiomatic Aspects of Composite Predicates in the History of English*. Ed. L. Brinton and M. Akimoto. Amsterdam/ Philadelphia: John Benjamins, 1999. 21-58.
- ALCOTT, Glenn. *Super Text Search*. 11 April, 2003. <<http://www.galcott.com>>.
- ALONSO RAMOS, Margarita. *Las colocaciones con verbo de apoyo*. Madrid: Visor, 2004.
- BAILEY, Richard W. *Nineteenth-century English*. Ann Arbor: Michigan UP, 1999.
- BIBER, Douglas. "Representativeness in Corpus Design." *Literary and Linguistic Computing* 8.4 (1993): 243-257.
- BIBER, Douglas, Stig JOHANSSON, Geoffrey LEECH, Susan CONRAD and Edward FINEGAN, eds. *Longman Grammar of Spoken and Written English*. London: Longman, 2000.
- CATTELL, Ray. *Composite Predicates in English*. Sydney: Academic, 1984.
- CLARIDGE, Claudia. *Multiword Verbs in Early Modern English: A Corpus-based Study*. Amsterdam: Rodopi, 2000.
- CRESPO, Begoña and Isabel MOSKOWICH. "Latin Forms in Vernacular Scientific Writing: Code-switching or Borrowing?" *Selected Proceedings of the 2005 Symposium on New Approaches in English Historical Lexis (HEL-LEX)*. Ed. R.W. McConchie et al. Somerville: Cascadilla, 2006. 51-59.
- CURME, George O. *English Grammar*. New York: Barnes and Noble, 1947.
- DIRVEN, René, ed. *A User's Grammar of English: Word, Sentence, Text, Interaction*. Frankfurt am Main: Peter Lang, 1989.

- DIXON, Robert M.W. *A New Approach to English Grammar on Semantic Principles*. Oxford: Clarendon, 1992.
- GLÄSER, Rosemarie. *Phraseologie der englischen Sprache*. Leipzig: VEB., 1986.
- GLEDHILL, Christopher. *Collocations in Scientific Writing*. Tübingen: Narr, 2000.
- HALLIDAY, M.A.K. "The Construction of Knowledge and Value in the Grammar of Scientific Discourse: Charles Darwin's *The Origin of the Species*." *Writing Science: Literacy and Discursive Power*. Ed. M.A.K. Halliday and J.R. Martin. Pittsburgh: Pittsburgh UP, 1993. 86-105.
- . "On the Language of Physical Science." *Writing Science: Literacy and Discursive Power*. Ed. M.A.K. Halliday and J.R. Martin. Pittsburgh: Pittsburgh UP, 1993. 54-68.
- HALLIDAY, M.A.K. and J.R. Martin, eds. *Writing Science: Literacy and Discursive Power*. Pittsburgh: Pittsburgh UP, 1993.
- HILTUNEN, Risto. "Verbal Phrases and Phrasal Verbs in Early Modern English." *Collocational and Idiomatic Aspects of Composite Predicates in the History of English*. Ed. L. Brinton and M. Akimoto. Amsterdam: John Benjamins, 1999. 133-166.
- HUDDLESTON, Rogert D. *The Sentence in Written English: A Syntactic Study Based on an Analysis of Scientific Texts*. Cambridge: Cambridge UP, 1971.
- KOIKE, Kazumi. *Colocaciones léxicas en el español actual: estudio formal y léxico-semántico*. Alcalá de Henares: Universidad de Alcalá, 2001.
- KYTÖ, Merja. "Collocational and Idiomatic Aspects of Verbs in Early Modern English." *Collocational and Idiomatic Aspects of Composite Predicates in the History of English*. Ed. L. Brinton and M. Akimoto. Amsterdam: Benjamins, 1999. 67-206.
- LAREO, Inés. *Colocaciones verbo-nombre en inglés moderno tardío: algunos aspectos de su comportamiento y evolución*. Diss. Universidade da Coruña. 2006.
- . "Make-Collocations in Nineteenth-Century Scientific English." *Studia Neophilologica* 80 (2008): 3-18.
- Lareo, Inés and María José ESTEVE-RAMOS. "18th-century Scientific Writing: A Study of Make Complex Predicates in the *Coruña Corpus*." *ICAME Journal* 32 (2008): 69-96.
- LEE, David. "Genres, Registers, Text Types, Domains, and Styles: Clarifying the Concepts and Navigating a Path through the BNC Jungle." *Language Learning and Technology* 5.3 (2001): 37-72.
- MATSUMOTO, Meiko. "Composite Predicates in Middle English." *Collocational and Idiomatic Aspects of Composite Predicates in the History of English*. Ed. L. Brinton and M. Akimoto. Amsterdam: John Benjamins, 1999. 59-96.
- MOSKOWICH, Isabel. "'To Lerne Sciences Touching Nombres and Propociouns': The Proportion of Affixation in Early Scientific Writing." *English Studies* 89.1 (2008): 39-52.
- MOSKOWICH, Isabel and BEGOÑA CRESPO. "Presenting the Coruña Corpus: A Collection of Samples for the Historical Study of English Scientific Writing." *Of Varying Language and Opposing Creed: New Insights into Late Modern English*. Ed. J. Pérez Guerra, J. L. Bueno Alonso, D. González Álvarez and E. Rama Martínez, Bern: Peter Lang, 2007. 341-357.
- NICKEL, Gerard. "Complex Verbal Structures in English." *IRAL* 6.1 (1968): 1-21.
- Oxford English Dictionary (OED)*. CD-ROM. Oxford: Oxford UP, 2002.
- POUTSMA, H. *A Grammar of Late Modern English. Part I: The Sentence. First Half 1928. Part II: The Parts of Speech. Section IA 1914; IB 1916; II 1926*. Groninger: Noordhoff, 1914-26.



- RENSKÝ, Miroslav. "English Verbo-nominal Phrases." *Travaux Linguistiques de Prague* 1 (1964): 289-299.
- SAGER, Juan, C., David DUNGWORTH and Peter F. McDONALD. *English Special Languages: Principles and Practice in Science and Technology*. Wiesbaden: Brandstetter, 1986.
- SÁNCHEZ RIVEIRO, Víctor. "Derivation and Compounding in ModE: Some Morphological Issues of Scientific Writing during the 18th century." Paper presented at the *ICEHL* 14. Bergamo. 2006.
- SIMPSON, John, Edmund WEINER and Philip DURKIN. "The Oxford English Dictionary Today." *Transactions of the Philological Society* 102.3 (2004): 335-381.
- STEIN, Gabriele. "The Phrasal Verb Type 'To Have a Look' in Modern English." *International Review of Applied Linguistics in Language Teaching* 29 (1991): 1-29.
- WIERZBICKA, Anna. *The Semantics of Grammar*. Amsterdam: John Benjamins, 1988.
- WOTJAK, Gerd. "Reflexiones acerca de construcciones verbo-nominales funcionales." *Estudios de fraseología y fraseografía del español actual*. Ed. G. Wotjak. Madrid: Iberoamericana, 1998. 257-279.

