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Medical case reports and titleology: A diachronic perspective (1840-2009)¹

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ABSTRACT

This paper is a diachronic analysis of a corpus of 180 titles drawn from CRs published in the *BMJ* and the *BMJ Case Reports* between 1840 and 2009. The frequency of occurrence of 69 variables (e.g. title type and length, punctuation, grammatical and syntactic data, number of authors and collaboration practices) was recorded for each title. The corpus was divided into three blocks (1840-1850, 1920-1930 and 2009) and between-block comparisons were carried out. Our findings show that CR titles have evolved over the 160-year period studied in the sense that they have increased in length, syntactic complexity, semantic richness and title type diversity. Authorship patterns and collaboration practices have changed, too. Although internationalization of case reporting has increased over time, today's preferred practice is still *local* collaboration. The only variable that has remained constant over the years is the *nominal* nature of CR

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titles. We put forth several social and scientific factors that could account for the various shifts observed. The non-informativeness of CR titles that persisted over time can be explained by the fact that CR authors are reluctant to give a generalization flavor to their findings based on single cases.

Keywords: medicine, case reports, titles, diachrony, BMJ, BMJ Case Reports.

1. Introduction

Since there is evidence that doctors sometimes make clinical decisions on the basis of the titles of journal articles (Haynes *et al.*, 1990, Goodman, 2000), titles should convey effectively the scope of the research and topic of the report, and, if possible, the design of the reported investigation while attracting attention and informing the primary target audience: editors and reviewers. Despite their succinctness, “titles are serious stuff”, asserted Swales (1990, p. 224), in that they “intrigue the reader and lure him into reading the whole article” (Haggan, 2004, p. 298). This is why titles should be clear, accurate and precise (Swales & Feak, 1994, Day, 1995, Hartley, 2008). As a matter of fact, the more precise and accurate the title is, the easier it is for bibliographers to compile data for indexing, abstracting and other documentation purposes. Economy and conciseness are the features of a title to which some scientific journal editors devote a few words in their instructions to contributors, but the most frequent guideline provided concerns title length (Yakhontova, 2002, Haggan, 2004, Soler, 2007).

It is Claude Duchet who, in 1973, coined the neologism “titrologie” (“titleology”, *cf.* Biacchi, 2003, cited in Soler, 2011, p. 124) to refer to research that deals with titles². At that time, research in titles exclusively dealt with literary works (Roy, 2008). Twenty years later, Swales (1990) claimed that titles were an

² According to Maurice Hélin (cited in Nobert, 1983, p. 380), etymologically, the title is a label (*titulus*) that is appended to the extremity of a stick (*umbilicus*) upon which was wrapped the papyrus that contained the text. That label allowed one to know, from the very start, the name of the work’s author without having to unfold the papyrus.

issue in academic genres that had not been fully addressed. Since then, as Soler (2011) remarks, the field has not only grown quite substantially but has also diversified itself through a heterogeneous range of topics. The vast and heterogeneously rich literature on the subject has indeed examined the issue from a range of various perspectives (Jaime-Sisó, 2009, Soler, 2011). However, medical case report (CR) titles have never been the object of any study, very likely because CRs are considered as a low profile genre, which is not entirely true (Salager-Meyer, 2012).

It is thus our intention here to fill that conceptual gap by presenting the results of a diachronic analysis of a corpus of CR *titles* from 1840 to 2009, and compare them with the findings obtained by previous research on titles in other scientific genres, such as the research paper and the review article. More precisely, the present study aims at answering questions related to the *evolution* of the type of CR titles, their length, grammatical and syntactic complexity, and authorship practices. By examining authorship data, this study seeks also to investigate the collaborative practices of medical CR writers.

2. Material and Methods

We analyzed a corpus of 180 randomly selected CR titles divided into three blocks comprising 60 CR titles each: block A from 1840 to 1850, block B from 1920 to 1930, and block C that covers the year 2009. Titles from blocks A and B were drawn from one single journal, the *British Medical Journal (BMJ)*. Since the *BMJ* stopped publishing case reports in the late 1990's, block C titles were drawn from the *BMJ Case Reports* that was launched at the end of 2008, and whose 2008 and 2009 issues are freely accessible on line. This explains why we chose the year 2009 as our block C.

Neither the *BMJ* nor the *BMJ Case Reports* has a stated policy regarding the writing of CR titles. The only policy of these two journals addresses the length of titles and the (non) use of abbreviations and, recently, the maximum number of authors allowed for that textual genre.

The frequency of occurrence of 27 different types of variables listed below was recorded in each of the 180 titles.

List of variables analyzed and examples drawn from blocks A-C of the corpus (block specified in brackets)

1. CR authorship
 - 1.1. Number of authors
 - 1.2. Their institutional affiliation: UK, Europe outside UK, others
 - 1.3. Type of collaboration: local (all authors from same health care center/university), national multicentric (authors from different health care/research centers/universities from the same country), international (authors from different countries)
2. Title length (counted as the number of running words)
3. Title types
 - 3.1. Informative type or verbal group title³

e.g. A 14-year-old girl *is cured* from venous poisoning (A)⁴
 - 3.2. Indicative type/nominal group title⁵
 - 3.2.1. “(A) case of ...”, “Two cases of ...”, “Three cases of...”

e.g. *A case* of narcolepsy (A)
 - 3.2.2. *General subject titles*

e.g. Epiploic appendagitis (C)
 - 3.2.3. *Attention-bidding titles (titles that use startling openings)*

e.g. Wedding ring in the wrong place (C)

³ The letter at the end of each example refers to the block from which the example was drawn.

⁴ A verbal title, also called “assertive sentence title” (Rosner, 1990), “declarative” (Smith, 2000), “informative (Goodman, 2000, McGowan & Tugwell, 2005), “declaratory” (Goodman *et al.*, 2001), “full sentence title” (Haggan, 2004), or “conclusion title” (Fischer & Zigmond, 2009), contains an active verb with a full sentence that usually states the findings or the conclusion of the research being reported, very much along the lines of newspaper headlines.

⁵ A nominal title, also called “indicative” or “descriptive”, does not contain any conjugated verb.

3.2.4. *Compound (or colon) titles: specific theme following a general heading generally separated from the heading by 1 or 2 colons, a semi-colon or a full stop*

– a colon

e.g. Fracture of the base of the skull: Recovery (B)

– two colons

e.g. Celullitis of the penis: a case report: death (C)

– a semi-colon

e.g. Progressive muscular atrophy of the peroneal type; twenty-one of the patient's relatives being also affected (B)

– two semi-colons and a colon

e.g. Case of hydrocephalus; treatment by puncture and seton; autopsy: with remarks (B)

– a full stop

e.g. Dislocation of the humerus reduced under the influence of chloroform. With observations (A)

3.3. Question titles

e.g. Is imaging necessary? (C)

4. Research steps: Does the title mention

– a purpose?

– a method?

– results/outcomes?

– a conclusion?

5. Grammatical and syntactic complexity

5.1. Present participles

e.g. Dissecting thoracic aortic aneurysm presenting with haematemesis (C)

5.2. Past participles

e.g. A case of ovarian tumour successfully removed (A)

5.3. Compound nouns and adjectives:

– nouns

e.g. *Nd-YAG laser treatment* in a patient with complicated pilonidal cysts (C)

– *ed*

e.g. *Cyclophosphamide-induced* reversible posterior leukoencephalopathy syndrome (C)

– *ing*

e.g. Unexplained high thyroid *stimulating hormone*: a “BIG” problem (C)

5.4. Prepositions (*in, of, on, with, without*, etc.)

e.g. Case *of* contraction *of* the mitral valve *without* vegetation or ossification (A)

5.5. Coordinating conjunctions (*for, and, nor, but, or, yet, so*)

e.g. A rare cause of dysphagia *and* gastroparesis (C)

5.6. Relative pronouns (*that, which, who/m/whose*)

e.g. Case *in which* the urachus remained pervious after birth (A)

5.7. Subordinate conjunctions (*as, while, whilst ...*)

e.g. Sarcoidosis with basal ganglia infiltration presenting *as* Parkinsonism (C)

3. Results and Discussion

3.1. Indicative/nominal group titles

All but five of the titles we analyzed consisted of more or less expanded *nominal* phrases, also called “indicative titles”, which give a straightforward presentation of the object of the study. Here are three examples, one from each block:

e.g. Myositis fibrosa progresiva (A)

e.g. Tumours of the frontal lobe of the brain (B)

e.g. Remodelling of coronary arteries (C)

This result clearly corroborates those of previous cross-disciplinary research on scholarly paper titles that also found a marked preponderance of nominal/indicative titles over verbal/informative/full sentence titles. Busch-Lauer (2000), for example, observed a much higher frequency of indicative titles over full sentence/verbal ones in a corpus of German and English medical *research article* titles, as did Haggan (2004) in a sample of *research articles* in linguistics, literature and science. Soler (2007), for her part, found that 72% of the English-medium *research papers* and *review articles* titles she analyzed in the field of biology belonged to the nominal group. In another study, that same researcher analyzed the structural construction of a corpus of *Spanish* titles of *research papers* and *review articles* in the biological and the social sciences, and found a prevalence of nominal group title construction in both textual genres and both disciplines (Soler, 2009).

It is when referring to the *evolution* of scientific titles that our results do contrast with those of previous titleology research. Indeed most research on the topic has underlined a shift over time towards full sentence (informative) titles. Almost 20 years ago, Berkenkotter and Huckin (1995), for instance, already reported that titles of *research articles* had become more informative over time. The findings of their research showed that in the 1970's, full-sentence titles were very rare, and that in the mid-1990s, they constituted more than 20% of all journal articles and were especially common in biology. An increasing number of conclusive/full sentence titles was also found in the multidisciplinary journal *Nature* where almost a quarter of titles of the *research articles* published in that journal in the last two decades anticipate the research conclusions, especially in molecular and developmental biology, thus adopting a journalistic style:

e.g. Glowing is rare on the sea floor (*Nature*, Vol. 789, N° 7416, September 20th, 2012)

Not so, however, in the other multidisciplinary journal *Science*, where only a minority of research article titles was found to be verbal (Jaime-Sisó, 2009). Goodman (2000, 2010), too, asserts that *research article* titles are becoming more informative, and that the third person singular in such titles increased 43-fold between 1970 and 2009. His research also showed that the increasing use of the third person singular in *research article* titles is even more pronounced in *core*

clinical journals: on average a 105-fold increase in such journals compared with a 43-fold increase in lesser quality journals.

The format of case reports being essentially that of a narrative, it is not surprising that their titles show a different line of evolution from that of the research article, a genre in which the narrative elements were gradually eliminated (Atkinson, 1992). What is more, because in a CR, the *n* of 1 precludes generalizations across population groups and because a single case history cannot be replicated, CR writers are most likely reluctant to use conclusive or informative titles that would tend to give a generalization “flavor” to the CR findings.

3.2. Title length

Today’s CR titles were found to be slightly longer than those from earlier periods, which means that the information load and semantic richness of CR titles have increased over time. In this respect, our findings corroborate the results of previous titleology studies. Lewinson and Hartley (2005) for example, reported a 1.25-fold increase in *research paper* title length between 1970-1974 and 2005-2009, and Goodman (2011) found an approximate doubling in the number of words in *research article* titles since the 1970s.

Coordinating conjunctions were also found to be more frequent in block C than in the previous two blocks. This finding is directly related to title length. Indeed, the more numerous the coordinating conjunctions in a title, the longer the title. The two most frequent coordinating conjunctions found in block C were “and” and “or”:

e.g. Syndrome of pleural *and* retrosternal “bridging” fibrosis *and* retroperitoneal fibrosis in patients with asbestos exposure (C)

The *colon* variable was also found to characterize block C, which means that their use has also increased over time. This, too, has a direct bearing on title length. It has been shown, indeed, that titles with colons, also called “compound titles” (Hartley, 2007) are longer on average and contain more information than titles without them.

In blocks A and B, colons were mainly used to introduce the findings of a surgical procedure (first example below) or the surgical procedure itself (second example):

e.g. Case of lithotomy: the calculus weighing seven ounces (A)

e.g. Strangulated umbilical hernia: Resection of gangrenous ileum at the age of 69 (B)

By contrast, in block C, colons are mostly used to underline the *rarity* of the CR:

e.g. Atypical uterine leiomyoma: a rare variant of a common problem (C)

Characteristic of blocks A and B as well, but more frequent in the former than in the latter, was the use of two colons in the same title, where the first colon introduced the consequence of the event described in the first part of the title (first example) or a surgical procedure (second example), and the second preceded the treatment outcome, either death or recovery:

e.g. Case of perforation of the stomach: peritonitis: death (A)

e.g. Fibroids complicating pregnancy: Hysterectomy: Recovery (B)

It is also interesting that the use of colons in today's medical *CR* titles contrasts quite sharply with the use of colons in today's medical *research article* titles, where (at least in the *British Medical Journal*) colons, in *research article* titles, precede an information that is compulsory, i.e. the type of the research being reported, whether it is a systematic review, a meta-analysis, a data base survey, a cross-sectional analysis, etc.:

e.g. Elevated rheumatoid factor and long-term risk of rheumatoid arthritis: a prospective cohort study (C)

All in all, our findings lead us to put forward a hypothesis that the longer titles from block C are explained by the fact that today's titles require more detailed information about the type of disease and its consequences, the uniqueness of the CR, its educational value and its originality. In short, today more bottom-line information is being loaded into the most highly fore-grounded part of any article, i.e. the title.

3.3. Syntactic complexity

Block A titles are quite easily understandable to the layman. The great majority of them started with the expression “(A) Case of”, as the following examples illustrate:

e.g. Case of traumatic tetanus (A)

e.g. Case of valvular disease of the heart (A)

Such titles were usually very short and syntactically and semantically rather simple. But CR titles became more and more complex, both semantically and syntactically.

The increasing syntactic complexity and semantic richness of CR titles are not only related to increasing length (see above), but also to the increasing number of compound nouns and adjectives in block C as a way to condense information (Salager-Meyer, 1984). What in block A or B would have been expressed as “Case of shortsightedness cured by operation” (A) would in block C be rendered as “Operation-cured shortsightedness”. Below are two examples of titles with compound nouns and adjectives:

e.g. Treatment of chronic bleeding of the small intestine in *Rendu-Osler-Weber disease* with *argon plasma coagulation* under *double-balloon enteroscopy* (C)

e.g. *Thyroid storm* induced by trauma due to *spear-fishing gun trident impactation* in the neck (C)

The higher frequency of compound nouns and adjectives in today’s titles is directly related to the low frequency of prepositions recorded in these titles. Prepositions, especially *of*, *by*, *in*, and *with*, were indeed found to be a distinctive feature of mid-19th century CR titles, as in the following examples:

e.g. Case *of* acute laryngitis, *with* remarks on Dr. Wardele’s cases *of* spasm glottidis (A)

e.g. Case *of* emphysema occurring *in* child-birth (A)

e.g. Case *of* varicose aneurism, cured *by* ligature *of* the brachial artery (A)

Interestingly, not only are compound nouns and adjectives more numerous in block C than in blocks A and B, but they are also longer, as some examples above and both examples below illustrate:

e.g. Diagnostic difficulty of pulmonary embolus in a bariatric patient and complication of therapeutic *dose low-molecular weight heparin* to the surgical anastomosis (C)

e.g. *Secondary bronchiolitis obliterans organizing pneumonia* in a patient with *carbamazepine-induced hypogrammaglobulinaemia* (C)

3.4. Commas and past participles (block A)

Commas, past participles and ‘mention of methods/treatment’ and ‘mention of outcome’ were all clearly characteristic of block A. This is explained by the fact that in the mid-19th century, all past participles expressed either a therapeutic procedure (first example below) and/or a surgical outcome (second example) and were preceded by a comma.

e.g. Cases illustrative of disease, seated chiefly in the cerebellum (A)

e.g. Case of varicose aneurism, cured by ligature of the brachial artery (A)

A unique example is the following one, where six commas were recorded, each of them preceding a past participle:

e.g. A case of muco-enteritis, followed by acute peritonitis, terminating in effusion into the abdominal cavity, relieved by profuse serous discharge from a spontaneous opening of the umbilicus by ulceration, followed by prolonged suppuration, repeated hemorrhage, and stercoraceous vomiting (A)

These three examples show that at that time much emphasis was put on the treatment administered and/or the surgical procedure performed and their final outcome (see the use of colons for introducing results/outcomes in block A titles, section above).

3.5. Title type diversity

3.5.1. General subject titles, also called “topic titles”, such as:

e.g. Pneumonic haemorrhagic effusion into pleura (B)

e.g. The therapeutic value of oxygen in pulmonary lesions (B)

were clearly characteristic of block B.

Conversely, *question titles* were found to be more frequent in block C than in the remaining two blocks. Here are two examples of such titles:

e.g. Giant cutaneous melanomas: evidence for primary tumour induced dormancy in metastatic sites? (C)

e.g. Mesodiverticular band simulating acute appendicitis? (C)

These question titles do not really suggest the lack of definite conclusions on a given topic, but are rather yes/no questions, the specific pragmatic thrust of which must be regarded as a specific rhetoric procedure, by which authors try to advertise their texts in order to attract possible readers. As Dietz (2001) points out, there is a kind of pedantic academic suspense to such questions that arouses the curiosity of colleagues by questioning a hitherto accepted thesis. What is more, with such titles, the author already presents solutions to a controversial problem that can then be seen as a specific means to “sell” one’s text. However, (Maisonneuve *et al.*, 2010) do not recommend question titles for CRs and research articles, and posit that such titles are better suited for editorials and/or oral communications. This is probably why their frequency, although higher in block C than in both blocks A and B, was found to be in general very low, a finding that corroborates those of cross-disciplinary (humanities, social sciences and biological sciences) and cross-linguistic (German, English and Spanish) research on titles (Busch-Lauer, 2000, Anthony, 2001, Hartley, 2007, Soler, 2007, 2011).

3.5.2. Attention-bidding titles were found to be also clearly more frequent in block C than in the remaining two blocks:

e.g. “Metallic taste”: search for the needle in a haystack (exemplary diagnostic measures and successful minimal invasive endoscopic treatment of a *needle-like copper-containing foreign body* in the gastric wall (C)

(Note the six-word compound in this example)

3.5.3. Authorship and collaboration practices

In 15% of mid-19th century CR titles, the institutional affiliation of the CR authors was not identified probably because it then seemed obvious that they worked at a British institution, since the *British Medical Journal* was a British journal. This practice had totally disappeared by the mid-20th century, when all authors' institutional affiliation was mentioned in the CR bylines.

Our findings also disclosed that the total number of authors recorded in today's titles was much greater than that recorded in either blocks A or B, i.e. it has been increasing over time. There was no collaboration whatsoever in blocks A and B. Today, in spite of the fact that the *BMJ* guidelines for authors set a limit to the number of CR authors (a maximum of four authors), over 10% of the CRs making up block C more than double that limit: extreme cases were two CRs written by nine authors and one written by 10 authors!

The growth in scientific collaboration, also called “hyper-authorship” (Cronin, 2002) across disciplines, institutions, sectors and national borders, has been extensively documented (Cronin, 2005, 2012), and numerous diachronic studies of different disciplines, fields and sub-fields have revealed a striking growth in the average number of co-authors per paper (Laband & Tollison, 2000, Cronin *et al.* 2003). This phenomenon has been related to the growing specialization of science in general. In the particular case of medical case reporting, multiple perspectives on different aspects of a clinical CR illustrate the value of team work among a diverse group of specialists over a particularly difficult or complex case presentation. To appropriate Castells' (2000) phrase that refers to scholarly *research articles*, “Scientific research in our time is either global or ceases to be scientific” (cited in Cronin, 2005, p. 18), although

collaboration and the notion of the “lone author” have been found to be very much discipline-related (Cronin, 2005, 2012). Our findings thus show that Castells’ phrase does not apply to *research articles* only, but also to CRs.

It is finally interesting to observe that *local* collaboration characterizes today’s CR writing more than national and international collaboration do. This clearly corroborates the results of recent research findings that show that physical location seems to influence to an appreciable extent those with whom one will work. This does not mean that today’s medical CR writers collaborate exclusively with researchers from their own institution or at the same geographical location, but to a considerable degree, as Sugimoto and Cronin (2012) found, that the choice of collaborators is influenced by place. “Gender and geography continue to be influential in shaping the contours of a scholar’s career in the digital age” (Sugimoto & Cronin, 2012, p. 458).

4. Conclusions

The following factors could account for the various shifts observed: (1) the progressive specialization and professionalization of medicine, (2) the need of multidisciplinary teams to conduct an ever-increasing complex research, (3) the rise of statistical methods and technologies, and (4) the growing complexity of medical science.

The only variable that has remained constant over the years is the nominal nature of case report titles. In that sense, CRs distinguish themselves from *research article* titles. With no fear of being mistaken, we can claim that the non-verbal (non-assertive) nature of CR titles is due to the fact that CR authors cannot generalize their findings to the whole population precisely because their case is based on one patient (or a few patients), which precludes them from making strong claims for their results and presenting definite assertions.

We could finally wonder whether CR titles will change in the future under the influence of titles in the other medical genres. Perhaps yes. As Richard Smith (2000) sarcastically reckons, the trend is undoubtedly for scholarly journals to become like newspapers and for newspapers to become more like tabloids because practitioners want “take home messages. It is about readability and trying to get people’s attention in an ever more crowded world” (p. 915).

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