



Nitpicking Online Knowledge Representations of Governmental Leadership

The Case of Belgian Prime Ministers in Wikipedia and Wikidata

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Abstract

A key pitfall for knowledge-seekers, particularly in the political arena, is informed complacency, or an over-reliance on search engines at the cost of epistemic curiosity. Recent scholarship has documented significant problems with those sources of knowledge that the public relies on the most, including instances of ideological and algorithmic bias in Wikipedia and Google. Such observations raise the question of how deep one would actually need to dig into these platforms' representations of factual (historical and biographical) knowledge before encountering similar epistemological issues. The present article addresses this question by 'nitpicking' knowledge representations of governments and governmental leadership in Wikipedia and Wikidata. Situated within the emerging framework of 'data studies', our micro-level analysis of the representations of Belgian prime ministers and their governments thereby reveals problems of classification, naming and linking of biographical items that go well beyond the affordances of

the platforms under discussion. This article thus makes an evidence-based contribution to the study of the fundamental challenges that mark the formalisation of knowledge in the humanities.

Keywords: digital humanities; data studies; Wikipedia; Wikidata politics

1. Introduction

Have we embraced complacency and become too comfortable with the internet's knowledge production capabilities? If so, by choosing to rest on our laurels and exploit this affordance, what happens to epistemic curiosity? (D'Arnault, 2019)

For all their rhetorical flair, these questions raised by *Digital Culturalist* blogger Clayton D'Arnault force us to face an inconvenient reality. Current estimates suggest that over 60 percent of the world's population is connected to the internet (Internet World Stats, 2020; Statista, 2020), and that of those people, a substantial group relies on search engines for information about its politics and its governmental leadership (Dutton, Reisdorf, Dubois, & Blank, 2017). Therefore, citizens curious about, say, the nomination date of former Belgian Prime Minister Sophie Wilmès, are likely to satisfy their information needs by turning to Google and Wikipedia, rather than to query the online portal of the Belgian Federal Public Service Justice to consult the legal nomination document in the Belgian official journal ('Belgisch Staatsblad', 'Moniteur belge') (Belgisch Staatsblad, 2019). It is safe to say that very few would go as far as to consult this physical document at the journal's archives. And in most cases, these knowledge-seekers would be right to assume that the world's leading search engine and the most prominent online encyclopedia yield relevant answers and facts.

However, while the merits of Google, Wikipedia and related projects cannot be overstated, it has also been established that these platforms are marked by algorithmic, ideological, gender and other forms of bias. Criticisms have for instance been levelled at Google's opaque ranking and rating algorithms (Wakabayashi, 2017), and an overreliance on the use of Google-like search engines fosters what Lynch (2016) describes as 'Google knowing', a form of knowledge-seeking that precludes critical comparisons between sources, and which boils down to following the opinion of the majority. Along those lines, Wikipedia has been shown to be a battleground for

conflicting ideological perspectives on the same topic (Rogers, 2013, Ch. 8), and to be marked by a significant gender gap in terms of editors (Ford & Wajcman, 2017), and content (Adler, 2016; Filipacchi, 2013; Women in Red, 2020). Similar concerns about knowledge diversity have been raised for Wikidata, a multilingual knowledge graph hosted by the Wikimedia foundation, which is predicted to become a key machine-readable knowledge base for artificial intelligence systems (Graham, 2012). Finally, research by among others McMahon, Johnson, and Hecht (2017), Vincent, Johnson, and Hecht (2018), and investigative reporting by *Wired* magazine has shown that the relationship between Google and Wikipedia is particularly close-knit (Matsakis, 2019). This is controversial, as it makes the Google-Wikipedia partnership the de-facto source of knowledge on the web, and thus also a political hub. The critical examination of representations of politicians on these platforms is therefore an active area of research. Recent scholarship in this domain has for instance uncovered that search results for politicians in Google and Wikipedia can be biased for gender and party identity (Pradel, 2020), and that editors of politicians' pages tend to focus on particular parties and choose references from specific news outlets (Agarwal, Redi, Sastry, Wood, & Blick, 2020).

2. Research Question and Hypotheses

These well-researched problems with the web's central knowledge sources lift the present article's main research question, that is: how deep does one actually need to dig into Wikipedia and Wikidata's historical, political or biographical information content, routed through Google or not, before confronting fundamental epistemological issues? We are thereby interested in those problems that emerge when considering representations of even the most basic data concerning governments and those in positions of government, such as their names and time in office. It is our contention that a variety of issues can be revealed through a detailed, comparative study of multilingual Wikipedia and Wikidata content of a same-topic item, in this case Belgian prime ministers, and that these problems transcend the affordances of the platforms under scrutiny. Specifically, we hypothesise that a micro-level analysis of these government-related data points towards fundamental problems of humanistic knowledge formalisation, such as concerns with the naming, classification and interlinking of entities.

On a foundational level, we thus address the question of how data in Wikipedia and Wikidata are *imagined* in the context of (digital) humanistic inquiry, thereby positioning our research in the emerging field of 'data studies'. Following media scholar Lisa Gitelman (2013), this humanistic endeavour at the intersections of science and technology studies and media studies asks how data are 'variously cooked within the varied circumstances of their collection, storage, and transmission' (idem, 3.). In the present context, this question can be approached from many angles. One might for instance choose to analyse the technological particularities of MediaWiki implementations such as Wikipedia or Wikidata as software platforms (MediaWiki, 2020a,b), investigate systemic bias (Martin, 2018; Oeberst, von der Beck, Cress, & Nestler, 2019), discuss the philosophical, sociological or economic foundations and impact of a free, open software movement (Tkacz, 2015), or explore the whole of Wikipedia or Wikidata content supported by big data approaches (Farda-Sarbas & Müller-Birn, 2019; Schroeder & Taylor, 2015). While each of these avenues is worth exploring, our approach instead draws inspiration from the epistemological criticism of information technologies and databases for humanistic knowledge in Oldman, Doerr, and Gradmann (2015), and the detailed analyses of online representations of humanistic (biographical) data and personhood in Brown and Simpson (2013). The latter effectively show how semantic web technologies, including the more sophisticated uses of ontologies such as OWL and SKOS fail to capture the nuance, complex relationships and social meanings that characterise humanities scholarship – complexities that 'might otherwise be overlooked or dismissed as a trivial technicality' (idem, p. 77). They achieve this by minutely examining the errors, blind spots and contradictions that mark the DBpedia and Project Orlando representations of the 'outlier' Michael Field, a pseudonym shared by the late Victorian writers Katharine Harris Bradley and Edith Emma Cooper. A thorough analysis of the problematic representations of one item of information content thus brings into view wide-ranging implications for the way in which humanist data is imagined in digital information spaces.

In the present study, we likewise assume the roles of critical knowledge-seekers, and engage in a practice that could be characterised as one of detailed information analysis, or, borrowing a term from biology, 'nitpicking'. Despite its pejorative overtones, the act of nitpicking is an essential task for most mammals, as it prevents infectious parasites from affecting the health of the social group. In the same sense, our 'grooming' of Wikipedia and Wikidata

targets inconsistencies and errors, which we consider as symptomatic for deeper problems with how humanistic data are demarcated and organised on said platforms. Concretely, we develop a case study that sifts through different layers of knowledge representation, starting from a Google search and concentrating on Wikipedia and Wikidata, in order to assess the data quality of a multi-lingual representation of a single-topic item: the factual information or data concerning Belgian governments and their prime ministers. This choice of topic is doubly motivated. For one thing – and contrary to Brown & Simpson – we chose not to examine an ‘outlier’, but instead to focus on the basic data concerning one of Europe’s central democracies. It is expected that a knowledge-seeker’s inquiry into the elementary data on Belgian governmental leadership should yield straightforward answers, especially from established knowledge bases such as Wikipedia and Wikidata, thus magnifying any discrepancies. Secondly, the topic aligns with the authors’ background knowledge, which facilitates the assessment of the retrieved data’s accuracy.

In order to concentrate our efforts as well as diversify the range of potential epistemological issues that are brought to light, we scrutinise the Dutch, French, English and German Wikipedia lists of historical Belgian governments and their leaders (focusing on data such as the names of the governments, their prime ministers, and the duration of their legislatures), the Wikidata equivalents of those Wikipedia lists, as well as different language-variants of the biographical Wikipedia pages of the post-war Belgian prime ministers Achille Van Acker (1898–1975), Leo Tindemans (1922–2014), and Sophie Wilmès (born 1975). A closer examination of the retrieved data allows us to systematically document and analyse crucial points where the data display a lack of agreement, both across sources (e.g. differences between the academic information and Wikipedia) and within a source (e.g. differences between different language versions of a Wikipedia item).

3. Data Collection and Methodology

The lists of governments and prime ministers, and the biographical pages that inform our main analysis were retrieved through a series of queries on Google, Wikipedia and Wikidata. As our case study consists of a ‘close reading’ of a limited number of information sources (pages) rather than a

big data analysis, we manually conducted our search through the graphical user interfaces instead of programmatically through their API's. The data were collected between April and July 2020. For the lists of governments, only the latest versions available in July were considered, for the biographical pages on Wikipedia, we also took into consideration the edit histories up to that point. The outcomes of each of the queries are documented in the tables included in the Appendix. The main purpose of these tables is to bring together and compare those data that might otherwise be spread over different platforms such as academic research projects and language-specific same-topic Wikipedia pages. In compiling the tables, transformations to the original research objects were kept to an absolute minimum, that is: we refrain from normalising or aggregating the data, and take it at face value. The remainder of this section documents the process of retrieving and organising the data that inform our further analysis.

3.1. Lists of Belgian Prime Ministers

The first, most general query that was executed consisted of searching the web for a list of prime ministers of Belgium. This search consisted of two stages. In a first stage, we consulted official and trusted resources in order to establish a factual baseline for the information on prime ministers. As of the moment of writing (July 2020), the official Belgian Federal Public service (FPS) website of the Chancellery of the Prime Minister thus yielded a chronological overview of prime ministers, which proved to be incomplete as it was missing the biographical descriptions of most prime ministers before 1979, as well as that of Mark Eyskens, who was prime minister in 1981 (Chancellery, 2020). Using the search window on the official website of the Belgian Parliament did not yield any results. However, a Google search did reveal the presence of a PDF document with an overview of Belgian governments since the Second World War on the website of the Parliament (Parliament, 2020). This document cannot be accessed through the website and is not up to date, as, at the moment of writing, it stays an orphaned web document fixed in time (2018). Finally, an academically peer reviewed and updated list of prime ministers was found through the website of the Royal Historical Commission of Belgium, which was founded in 1834 and has as its mission to provide access to written sources and studies related to the history of Belgium. One of these sources is the 'Belelite' database project (henceforth: 'RHC-Belelite'), which was

started in 2017 under the supervision of KU Leuven Professor Emmanuel Gerard (Aspeslagh, Verleden, Matheve, Heyneman, & Gerard 2020). This authoritative academic list of prime ministers since the independence of Belgium is used as a basis for further comparisons. With our academic baseline thus established, we executed a Google search for the term 'List of Belgian prime ministers', which returned a Wikipedia page with such a list as one of the first results. As Wikipedia provides a link to all language versions of any page, the associated pages in English, Dutch, French and German are easily accessible. Appendix Tables 1a, b offer a comprehensive comparison between the RHC-Belelite data and these Wikipedia lists of prime ministers.

3.2. Biographical Pages of Prime Ministers on Wikipedia

In a second step, data including the edit histories were sourced from the English, Dutch, French and German language versions of the biographical pages of three selected prime ministers, with the aim of scrutinising problematic representations and examining the differences between and within the versions of these biographies. This changelog was accessed through the 'View history' tab in the top-right corner of each Wikipedia page. We limit our scope to three biographies out of approximately 70 possible historical holders of the office of prime minister, in order to leverage a more meticulous comparative analysis. The political figures under discussion here are Achille Van Acker, a socialist prime minister of multiple governments between 12 February 1945 and 3 August 1946, Leo Tindemans, a Christian-democrat leading multiple governments between 25 April 1974 and 20 October 1978, and Sophie Wilmès, the incumbent prime minister of Belgium who replaced Charles Michel on 27 October 2019 when he was elected president of the European council and who was the leader of a minority government between 17 March 2020 and 1 October 2020.

In our comparative investigation of these Wikipedia entries, we take into consideration any edits to the biographical text or the infobox (a boxed summary on the right-hand side of the Wikipedia page) that are documented in the page's changelog. This notably includes changes in the text strings and hyperlinks referring to the office of Prime minister of Belgium. The detailed outcomes of this query are documented in Appendix Tables 2–4a–d.

3.3. Wikidata Items

A third and final step of data collection consisted of the creation of a list of Belgian prime ministers from Wikidata, with the objective of establishing a comparison between these Wikidata entries and the lists sourced from Wikipedia. A list of Belgian prime ministers with a record for each prime minister with start and end dates of their continuous mandates as PM was obtained by entering the relevant SPARQL queries into the Wikidata Query Service. A first query yielded a list of 72 entries (<https://w.wiki/ZX4>). As this list excluded the incumbent prime minister Wilmès, a second query was created to obtain the missing entry (<https://w.wiki/ZXH>). Appendix Tables 5a–d contrast the outcomes of these queries with the corresponding Wikipedia lists of prime ministers.

4. Findings and Discussion

The tables in the Appendix allow us to systematically compare data from the different pages and platforms, with the aim of documenting inconsistencies within and across sources.

4.1. Problems with the Retrieved Lists of Belgian Governments and their Prime Ministers

A general observation that can be made with regards to retrieving lists of Belgian governments and their prime ministers, is that for knowledge-seekers it is non-trivial to find an authoritative version of such a list. This can be explained by the lack of an official list of Belgian prime ministers, as well as some shortcomings in the available literature and resources, such as a lack of broad historical coverage, a lack of digital resources, and occasional errors (Aspeslagh et al., 2020). When we compare the different-language Wikipedia listings of Belgian governments and their prime ministers with the authoritative RHC-Belelite list (see Appendix Tables 1a, b), a further four types of problems can be discerned.

Firstly, the data reflect different interpretations as to who actually held the office of Prime Minister at different points in time. This is particularly the case

for the listings of the first Belgian governments. According to RHC-Belelite for instance, the first Belgian government leader was Goblet (28 February 1831–23 March 1831). Yet according to all of the Wikipedia listings, Belgium's first prime minister was De Gerlache. It should also be noted that there are inconsistencies in how the latter's time in office is represented differently on the Dutch and French Wikipedias on the one hand, and the English and German ones on the other. Belgium's second prime minister according to RHC-Belelite is De Sauvage, whereas the Wikipedia lists put forward Lebau as prime minister, again with diverging term dates between them. Similar problems can be observed in the descriptions of the governments under De Meûlenaere and Goblet d'Alviella.

Secondly, the data display a lack of consensus about what constitutes a successor of a new government under the same prime minister. RHC-Belelite for instance lists three governments with Jaspar as Prime Minister, whereas the Dutch, French and English Wikipedia lists discern only two, and the German Wikipedia list mentions only one. A knowledge-seeker is confronted with a similar disagreement among sources in the case of the governments of Pierlot, some of which worked from exile in London during the Second World War. While sources agree on the start date of the first Pierlot government and the end date of the last Pierlot government, RHC-Belelite lists seven governments within this timeframe, and the Wikipedia lists only attest to six governments. These differences stem from an apparent lack of a common definition of what constitutes a successor government *versus* a continuation of the same government with some of its ministers changed.

Thirdly, we can observe some discrepancies between the authoritative RHC-Belelite list and the Wikipedia entries stemming from what are most likely typographical errors. It appears, for instance, that days and months are switched around in the dates that mark the end of Tindemans I and the start of Tindemans II in the English Wikipedia list. According to RHC-Belelite, Tindemans II ends on 6 March 1977 (06-03-1977 in Day-Month-Year notation). The English Wikipedia, in contrast, puts forward 3 June 1977 (03-06-1977 in Day-Month-Year notation) as the end of Tindemans I and the beginning of Tindemans II.

Fourthly, differences can be observed in the represented start and end dates of governments. In this regard, a striking example that reflects the possible extent of discrepancies between Wikipedia-representations and authoritative

sources, is that of the recent governments of Michel and Wilmès. After Charles Michel, the then prime minister of the government Michel II, was elected president of the European council and he was replaced as PM by Sophie Wilmès on 27 October 2019. Wilmès then led the government Michel II until she eventually became the prime minister of a new minority government on 17 March 2020. RHC-Belelite correctly lists three Belgian governments between 11 October 2014 and 31 July 2020: Michel I (11 October 2014–9 December 2018), Michel II/Wilmès (9 December 2018–17 March 2020), and Wilmès I (starting on 17 March 2020). The Dutch, French and English Wikipedia lists of Belgian prime ministers, by contrast, each demarcate two Michel governments and two Wilmès governments. This example demonstrates that the different sources hold contrasting interpretations of how successive governments can and should be represented: RHC-Belelite has adjusted its naming convention for the idiosyncrasy of this change of prime ministers, while the Wikipedia lists rigorously follow the Belgian political *mores* of naming governments after their prime minister. Consequently, the latter leads to a contradiction when there is a de-facto new prime minister, but not a new government. Zooming in on the data, it can indeed be seen that all sources agree on 11 October 2014 as the start date of Michel I. However, while RHC-Belelite states that Michel I ends on 9 December 2018, the English Wikipedia list has Michel I ending on 21 December 2018. The successor government is named ‘Michel II/Wilmès’ by RHC-Belelite, with a start date of 9 December 2018. The English Wikipedia list puts this start date on 21 December 2018. This is consistent with the end date of Michel I in either list. RHC-Belelite has ‘Michel II/Wilmès’ ending on 17 March 2020. The English Wikipedia has the same end date for Wilmès I. Thus, according to RHC-Belelite, the incumbent government at the time of writing this article is Wilmès I, but according to the Wikipedia lists it is Wilmès II.

4.2. Problems with the Wikipedia Lists of Belgian Governments and their Prime Ministers

Further differences and inconsistencies are foregrounded when we compare the different language versions of the Wikipedia listings of governments among each other (see Appendix Table 1a, b). Firstly, the data show important differences in the spellings of first names, which are sometimes adapted to the main language of the article, but not consistently. ‘Frans Schollaert’ on

the Dutch, English and German Wikipedias for instance equate to ‘François Schollaert’ on the French Wikipedia. ‘Henri Carton de Wiart’ in the French Wikipedia becomes ‘Henry Carton de Wiart’ in the English version. Another example of inconsistent naming is the concatenation of ‘Van de Vyvere’ to ‘Vande Vyvere’ in the German Wikipedia. Similarly, there is a lack of systematicity in the naming of governments, which sometimes consist of a single name and sometimes of two names. The convention of using double names of governments (e.g. De Mûelenaere-Nothomb or De Theux-Malou) are mostly the result of adding a precursor or successor to a government name, except for the case of Pouillet-Vandervelde in the English Wikipedia, which apart from the name of Prime Minister Prosper Pouillet also includes the name of the minister of foreign affairs Emile Vandervelde.

Secondly, the different language versions display a lack of agreement on the start dates and end dates of governments, in particular in the case of the first three governments. The first Belgian government led by de Gerlache took office on 26 February 1831 according to the Dutch and French Wikipedia, but the German and English Wikipedia posit 27 February 1831 as the start date. The difference is larger with regard to the end date of this government, as the Dutch and French Wikipedia indicate 23 March as end date, but German and English Wikipedia mention 10 March 1831, a difference of almost two weeks. The successor government of Lebeau took office on 23 March 1831 in Dutch and French Wikipedia, whereas the German Wikipedia gives 28 March 1831 as start date but all three do mark 21 July 1831 as end date. Finally, the English Wikipedia declares 10 March as the start date. The Lebeau government ended on 21 July 1831 in every language except for the English Wikipedia, where it is presented as ending on 24 July 1831. Furthermore, the third Belgian Government of de Mûelenaere took office on 24 July 1831 according to the German and English Wikipedia, but according to the Dutch and French Wikipedia this happened two days later (26 July 1831). The latter gives as end date 17 September 1832, but the German and French Wikipedia mark 20 October as the end date of that government.

Finally, we can observe that as a result of the inconsistent splits or concatenations of governments across the different languages, the total number of Belgian governments since 1831 is different for several of the studied Wikipedia pages. The Dutch Wikipedia page thus lists 99 Belgian governments, the French version 98 governments, and the English version

96 governments. The German version does not give a ranking number to Belgian governments, but does rank the Belgian governments in historical order (Appendix Table 1a, b).








4.3. Problems with the Prime Ministers' Biographical Articles

A deeper analysis of the individual biographical Wikipedia pages (including a comprehensive look into their development over time) reveals the extent of content and information differences of a Wikipedia biography in different languages. The structure, contents and edit histories of these pages testify to variances in what is considered appropriate, worthwhile and correctly sourced information to be included in biographies, as well as to the differences in the pace with which this information is edited or corrected.

For one thing, these discrepancies manifest themselves on the pages' structural level. While preformatted templates for writing articles and categorising information exist on Wikipedia, editors are not obliged to follow them. Consequently, different versions of the same topic item, such as a biography, can consist of different sections, which in themselves might contain very different types of information. This, e.g., becomes readily apparent when we compare the different language versions of the biographical page of Sophie Wilmès (see Appendix Figure 3a–b for full renderings of the pages), or the corresponding infoboxes (see Figure 1).

The edit histories of the different language versions of the pages reveal a further diversity and debate about which information to include or exclude. Until 19 April 2007, e.g., the first sentence of the Dutch version of Achiel Van Acker's biography referred to him as a 'freemason' (AVA:NL 2020). This qualification was removed, with one commenter explaining that Van Acker might as well be called a 'broom binder' or 'basket weaver'. This relatively swift change contrasts with a rather joking reference to Van Acker's lack of mastery of Hebrew when meeting then-prime minister of Israel, which was only removed from the Dutch page on 21 June 2013, after figuring online for nine years. The French version of the page even features a similar joke since 5 November 2005, albeit in its 'anecdote' section (AVA:FR 2020). The editors' criteria for relevance thus seem rather heterogeneous, and the speed at which corrections are made differs between language versions.

Fig. 1: Side-by-side comparison of the infoboxes on the biographical Wikipedia pages of Sophie Wilmès (SW:NL 2020, SW:FR 2020, SW:DE 2020, and SW:EN 2020; snapshots show the last available revisions up to the end of July 2020).¹

<p>Sophie Wilmès</p>  <p>Geboren Elsene, 15 januari 1975</p> <p>Land  België</p> <p>Partij MR</p> <p>Aangetreden 27 oktober 2019</p> <p>Regering Wilmès I Wilmès II</p> <p>Voorganger Charles Michel</p> <p>Federaal minister van Wetenschapsbeleid en Begroting, belast met de Nationale Loterij</p> <p>Aangetreden 22 september 2015</p> <p>Einde termijn 27 oktober 2019</p> <p>Regering Michel I Michel II</p> <p>Voorganger Hervé Jamar</p> <p>Opvolger David Clarinval</p> <p>Portaal  België Politiek</p>	<p>Sophie Wilmès</p>  <p>Sophie Wilmès à la Chambre des représentants en 2020.</p> <p>Fonctions</p> <p>Première ministre de Belgique</p> <p>En fonction depuis le 27 octobre 2019 (11 mois et 18 jours)</p> <p>Monarque Philippe</p> <p>Gouvernement Wilmès I et II</p> <p>Législature 55^e</p> <p>Coalition CD&V-Open VLD-MR</p> <p>Prédécesseur Charles Michel</p> <p>Ministre fédérale de la Fonction publique chargée de la Politique scientifique</p> <p>9 décembre 2018 – 27 octobre 2019 (10 mois et 18 jours)</p> <p>Premier ministre Charles Michel</p> <p>Gouvernement Michel II</p> <p>Prédécesseur Sander Loones (Fonction publique) Zuhair Demir (Politique scientifique)</p> <p>Successeur David Clarinval</p> <p>Ministre fédérale du Budget chargée de la Loterie nationale</p> <p>22 septembre 2015 – 27 octobre 2019 (4 ans, 1 mois et 5 jours)</p> <p>Premier ministre Charles Michel</p> <p>Gouvernement Michel I et II</p> <p>Prédécesseur Hervé Jamar</p> <p>Successeur David Clarinval</p> <p>Biographie</p> <p>Date de naissance 15 janvier 1975 (45 ans)</p> <p>Lieu de naissance Ixelles (Belgique)</p> <p>Nationalité Belge</p> <p>Parti politique MR</p> <p>Diplômé de IHECS ISG Saint-Louis Rhode-Saint-Genèse (personnelle) Le Lambertmont, Bruxelles (officielle)</p>  <p>Premiers ministres belges</p> <p>modifier</p>	 <p>Sophie Wilmès (2020 in der Belgischen Abgeordnetenkanammer)</p>	<p>Her Excellency Sophie Wilmès</p>  <p>52nd Prime Minister of Belgium</p> <p>Incumbent</p> <p>Assumed office 27 October 2019</p> <p>Monarch Philippe</p> <p>Deputy Koen Geens Alexander De Croo Dieder Reynders (2019) David Clarinval</p> <p>Preceded by Charles Michel</p> <p>Minister of Budget</p> <p>In office 1 October 2015 – 27 October 2019</p> <p>Prime Minister Charles Michel</p> <p>Preceded by Hervé Jamar</p> <p>Succeeded by David Clarinval</p> <p>Personal details</p> <p>Born 15 January 1975 (age 45) Ixelles, Brussels, Belgium</p> <p>Political party Reformist Movement</p> <p>Spouse(s) Chris Stone</p> <p>Children 4</p> <p>Parents Philippe Wilmès (father)</p> <p>Education Saint-Louis University, Brussels</p>
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¹See Appendix 2 for the URLs of the websites denoted by SW:EN and similar abbreviations.

A closer look at the edit histories of the biographies of Leo Tindemans shows some remarkable changes in the number of governments in which he participated. Tindemans was prime minister from 25 April 1974 till 20 October 1978. All his Wikipedia biographies were first created in 2004. Until the end of 2006 the Dutch biography referred to six governments (LT:NL 28-03-2004 @ 19:06 till LT:NL 14-11-2006 @ 08:44), thereafter it referred to only two governments. Until 2011, the French biography stated that he was prime minister, without mentioning the number of governments over which he presided (LT:FR 17-09-2011 @ 12:17), after which date the infobox mentions four governments. The German Wikipedia biography only refers to the fact that he was prime minister without referencing his governments (LT:DE 2020). The English Wikipedia changes the number of governments he led from six to two in November 2007 (LT:EN 05-11-2007 @ 19:12, LT:EN 10-11-2007 @ 01:31). When inspecting the Wikipedia pages of each government in the different languages at the time of writing, the Dutch Wikipedia has separate pages for two Tindemans governments (Tindemans I, II), whereas the French and German Wikipedias each have four pages (Tindemans I, II, III, IV). The English Wikipedia does not offer specific pages for governments led by Tindemans. Arguably, the reasons for these differences are political-cultural, and depend on whether or not a transformation from a minority government to a majority government (or vice versa), notably through participation of regionalist political parties, is interpreted as constituting a new government. Starting out as a minority government, the first Tindemans I government was enlarged with a regional Walloon government (Tindemans II) which quit after three years, returning Tindemans to lead a minority government (Tindemans III). After elections a new Belgian majority government was formed (Tindemans IV). The French Wikipedia considers these as four separate governments, whereas the Dutch Wikipedia groups the first three together into one government.

Immediately after becoming the prime minister the edit histories for some of the biographical pages of Sophie Wilmès add information about her ancestry. Since 1 November 2019, the French version features the statement that ‘her mother is Jewish and lost multiple relatives in the Shoah’, with a reference to the newspaper the *Times of Israel* (SW:FR 01-11-2019 @ 05:31). This statement is debated in the discussion section, which raises concerns about the relevance and potential privacy issues concerning such information. Similar references to Wilmès’ ancestry are made on the German and English pages, which also cite Israeli newspapers as their sources (SW:DE 29-10-2019

@ 21:08, SW:EN 28-10-2019 @ 19:11). The Dutch page, by contrast, mentions the professional credentials of Wilmès' mother, but does not refer to religion (SW:NL 2020). Thus, in this case, the texts and discussions reveal different ideological stances to the subject matter.

The problems of classification that present themselves in the body of the pages are further reflected in the historical changes made to the pages' hyper-link texts and infoboxes (see Appendix Tables 2–4a–d for an in-depth evaluation). A detailed but crucial piece of information to consider here, are the strings that classify the political figures under discussion as 'prime ministers', and the destinations to which these classifiers might lead. These strings display a high degree of variation over time and between language versions. On the Dutch page of Achiel Van Acker for instance, the string 'premier van België' ('Belgian Prime Minister') refers to a Dutch page that explains the role of 'Eerste minister' by contrasting it with the regional Belgian functions of Flemish 'minister-president' and the term used for the leader of the Dutch government (also 'minister-president') (Appendix Table 2a). In this version, there is no link to the aforementioned Wikipedia list of Belgian prime ministers. The French and English Wikipedia biographies do however alternate between referring to a detailed page on the role of 'prime minister' and the contextualising overviews of lists of prime ministers (Appendix Table 2b and Table 2d). The German page does not contain any hyperlinks from the string 'Premierminister' (Appendix Table 2c). Furthermore, this page never featured a summary infobox.

In addition to similar types of problems, the biographical pages of Leo Tindemans present a mismatch between the non-hyperlinked number in the succession of Belgian prime ministers, and the actual, correct number. A string such as '58^{ste} Premier van België' (Appendix Table 3a) is thus 'hard-coded' by the writer of the article, and in no way connected to the numberings in the Wikipedia listings of Prime Ministers discussed earlier.

Finally, a particularly striking classification choice concerns the fact that the English Wikipedia page for Sophie Wilmès includes the prime minister in the list of 'Jewish Belgian politicians' (a category which exists only in English, Hebrew and Urdu), as well as the list of 'Jewish Prime Ministers' (a category that exists only in English, Hebrew, Urdu, and Vietnamese). However, apart from mentioning her mother's Jewish ancestry, none of the actual biographical texts discussed above claims that Wilmès herself is Jewish.

4.4. Wikidata representations

The third level of representation (which could be considered the ‘deepest’ level), comprises the Wikidata knowledge graph. While Wikidata is intended to become one of the main knowledge bases for artificial intelligence systems, a close comparison of the retrieved data with the authoritative RHC-Belelite information reveals similar inconsistencies as the Wikipedia data (see Appendix Table 5a). One such inconsistency is the end date of the government of De Trooz, which is marked as 9 January 1908 in RHC-Belelite, but as 31 December 1907 in all of Wikipedia, and Wikidata.

Of particular interest here, however, are a number of discrepancies between the Wikipedia lists of prime ministers, and the corresponding Wikidata items (Appendix Tables 5b–d). When we, e.g., inspect the succession of the governments of Paul Vanden Boeynants by the government of Gaston Eyskens, a logical contradiction presents itself, as Wikidata lists two different start dates for this government (17 June 1968 and 17 July 1968) (Appendix Table 5b). The former date is consistent with the RHC-Belelite list, the latter is consistent with Wikipedia’s listing. A similar situation presents itself in the case of the governments Vanden Boeynants-Martens (Appendix Table 5c). Here as well, Vanden Boeynants’ premiership is contradictorily presented as ending on two different dates (3 April 1979 in RHC-Belelite as well as the German and English Wikipedia listings of Belgian prime ministers *and* 3 March 1979 in the Dutch and French Wikipedia listings of Belgian prime ministers). Finally, when we zoom in on the governments of Mark Eyskens, who succeeded the fourth Martens government, the start of the premiership of Mark Eyskens is likewise marked by two different dates (6 April 1981 in RHC-Belelite *and* 31 March 1981 in all Wikipedia listings of Belgian prime ministers) (Appendix Table 5d).

These detailed observations profoundly problematise the relation between Wikipedia and Wikidata, as it is obvious that both platforms are not as closely connected as their names would suggest. While Wikidata formalises some of the ontological categories that are also present in the Wikipedia data and biographical pages discussed earlier (such as start and end dates of governments), we can nonetheless observe problems on the level of the actual information content, that is, of the facts that fill these ontological categories. Arguably, the observed differences between the Wikidata items and

same-topic Wikipedia information can be attributed to the fact that these projects do not necessarily share user communities (also see Wikidata, 2020 for a discussion on the relation between both projects).

4.5. Overview of findings

Our ‘nitpicking’ of the knowledge representations of Belgian governments and their prime ministers yields four main findings concerning the individual platforms under investigation, as well as the relationships between those platforms. For one thing, the examined data suggest a lack of agreement between authoritative academic sources on Belgian governments and their leadership, and the information that is presented in Wikipedia. Moreover, it has been shown that, unlike the Wikipedia information, authoritative sources are not easily retrieved by knowledge-seekers through a traditional Google search. Next, the examined data show that for basic factual information, there can be disparity between the different language Wikipedia articles on the same topic, be they lists of governments and their leaders, or biographical pages dedicated to individual prime ministers. Furthermore, it has been demonstrated that there are significant differences between the information presented in Wikipedia and that in Wikidata, suggesting a rather loose-knit relation between both platforms. Finally, the different types of errors that were discussed span different categories, including problems of naming, classification, and linking.

5. Implications and conclusions

We have investigated different representations of factual biographical information about Belgian prime ministers, in order to test the central hypothesis that a detailed analysis of these representations might reveal inconsistencies and errors that are indicative of more fundamental epistemological problems. In support of this main hypothesis, a detailed analysis of the information content on Belgian prime ministers as found on Google, Wikipedia and Wikidata indeed revealed different types of inconsistencies and errors. Yet, what are the implications of these observations for the online representation of knowledge, in particular humanistic knowledge related to those in positions of power?

First and foremost, it should be acknowledged that the observed problems can in part be attributed to the affordances of the platforms under discussion. Differences between the linguistic variants of Wikipedia pages on the same topic for instance, are due to the fact that these pages are by no means translations, but rather stand-alone pages that are often edited by different communities. Discussions in the 'Discussion' section of the French version of the pages are mostly conducted by Francophone editors, whereas discussions concerning the Dutch page are conducted in Dutch. Similarly, some of the problems with Wikidata might be attributed to the fact that this project's data are sourced by humans and machines (bots) alike, and that much of its social and technical infrastructure is still under development.

Of course, the errors and inconsistencies observed in our case study do not render platforms like Wikipedia or Wikidata useless. Pragmatically speaking, the documented issues could manually be resolved by any engaged Wikipedian. However, a different picture presents itself when we consider that we have only discussed a fraction of the information related to the 70 historical Belgian prime ministers available in 19 of Wikipedia's many languages, let alone of all the other potential topics that could have been chosen as the object of this study. In order to tackle the observed problems at this scale, a degree of automation becomes necessary. While proposing such a technical solution is beyond the scope of this article, we argue that the type of grooming demonstrated in these pages is a necessary prerequisite for the construction of such systems, as an understanding of the fundamental problems precedes their solutions.

In this regard, the nature of the observed errors does point to deeper issues. First and foremost, it is striking that most of the observed problems go to the core of any knowledge representation, that is: naming, classifying and interlinking entities. The representations that were evaluated fail to capture or find a consensus on the details that define biographical personhood and identity. Indeed, our analyses have revealed problems with the spelling of names of individual prime ministers, the nomenclature of the governments in which they served, and the start and end dates of these governments. Moreover, mechanisms for resolving those issues, such as hyperlinks, were revealed missing or inadequate. Such details and problems can easily be overlooked in 'big data' approaches. In this regard, the

outcomes of our case study align with previous research on the problem of formalising humanistic knowledge conducted by Brown and Simpson (2013).

When we finally do zoom out again and, following Gitelman (2013), evaluate how humanist data might be *imagined* on Google, Wikipedia and Wikidata, we have begun to reveal a rather fragmented picture. While the three platforms under discussion are growing towards each other on an organisational level, the actual representations of same-topic items are still quite disjointed. This is not because the objects themselves are marked by differences or fragmentation (although we have acknowledged some idiosyncrasies pertaining to the Belgian situation), but rather because on the level of information contents, the platforms display important discrepancies and errors. Our findings thus stress the continued importance of critical, humanistic evaluation of data, especially in growing knowledge ecosystems where humans increasingly work alongside machines. In such environments, where errors are (semi-)automatically compounded or fed into newer knowledge systems, it is necessary to remain epistemologically curious and vigilant about information quality, in particular at the smallest scales. Future research is thus required to continuously monitor the state and quality of our trusted knowledge bases, and to develop measures for incorporating humanistic criticism into information infrastructures.

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References

Adler, M. (2016). Wikipedia and the myth of universality. *Nordisk Tidsskrift for Informationsvidenskab og Kulturformidling*, 5(1), 37–41. <https://doi.org/10.7146/ntik.v5i1.25882>.

Agarwal, P., Redi, M., Sastry, N., Wood, E., & Blick, A. (2020). *Wikipedia and Westminster: Quality and dynamics of Wikipedia pages about UK politicians*. Proceedings of the 31st ACM Conference on Hypertext and Social Media

(HT '20) (pp. 161–166). Association for Computing Machinery. <https://doi.org/10.1145/3372923.3404817>.

Aspeslagh, P., Verleden, F., Matheve, N., Heyneman, C., & Gerard, E. (2020). *Belelite: Databank van de Belgische regeringen sinds 1831*. www.koninklijkecommissiegeschiedenis.be/belelite.

Belgisch Staatsblad. (2019). 27 OKTOBER 2019. – *Koninklijk besluit regering. – Wijziging. – Benoeming*. https://www.ejustice.just.fgov.be/cgi/article_body.pl?langa=nl&caller=summary&pub_date=19-10-30&numac=2019015237.

Brown, S., & Simpson, J. (2013). *The curious identity of Michael Field and its implications for humanities research with the semantic web*. 2013 IEEE International Conference on Big Data, IEEE, pp. 77–85. <https://doi.org/10.1109/BigData.2013.6691674>.

Chancellery. (2020). *Tijdslijn*. FOD Kanselarij van de Eerste Minister. <https://kanselarij.belgium.be/nl/eerste-minister/tijdslijn>.

D'Arnault, C. (2019, July 24). *On informed complacency and the potential decline of curiosity: The misconception of convenience*. Digital Culturalist. <https://digitalculturalist.com/on-informed-complacency-and-the-potential-decline-of-curiosity-773c9105e940>.

Dutton, W. H., Reisdorf, B., Dubois, E., & Blank, G. (2017). *Search and politics: The uses and impacts of search in Britain, France, Germany, Italy, Poland, Spain, and the United States* (Quello Center Working Paper No. 5-1-17). Social Science Research Network <https://doi.org/10.2139/ssrn.2960697>.

Farda-Sarbas, M., & Müller-Birn, C. (2019). Wikidata from a research perspective: A systematic mapping study of Wikidata. <https://arxiv.org/abs/1908.11153v2>.

Filipacchi, A. (2013, April 28). Wikipedia's sexism toward female novelists. *New York Times*. <http://www.nytimes.com/2013/04/28/opinion/sunday/wikipedias-sexism-toward-female-novelists.html>.

Ford, H., & Wajcman, J. (2017). 'Anyone can edit', not everyone does: Wikipedia's infrastructure and the gender gap. *Social Studies of Science*, 47(4), 511–527. <https://doi.org/10.1177/0306312717692172>.

Gitelman, L. (2013). *Raw data is an oxymoron*. The MIT Press.

Graham, M. (2012, April 6). The problem with Wikidata. *The Atlantic*. <https://www.theatlantic.com/technology/archive/2012/04/the-problem-with-wikidata/255564/>.

Internet World Stats. (2020). *World internet usage and population statistics. 2020 Year Q-2 estimates*. Miniwatts Marketing Group. <https://internetworldstats.com/stats.htm>.

Lynch, M. (2016). The internet of us: Knowing more and understanding less in the age of big data. Norton/Liveright.

Martin, B. (2018). Persistent bias on Wikipedia. Methods and responses. *Social Science Computer Review*, 36(3), 379–388. <https://doi.org/10.1177/0894439317715434>.

Matsakis, L. (2019, January 22). *Google gives Wikimedia millions – plus machine learning tools*. Wired – Business. <https://www.wired.com/story/google-wikipedia-machine-learning-glow-languages/>.

McMahon, C., Johnson, I., & Hecht, B. (2017). *The substantial interdependence of Wikipedia and Google: A case study on the relationship between peer production communities and information technologies*. Proceedings of the eleventh international AAAI conference on web and social media, Montréal, May 15–18, 2017. https://brenthecht.com/publications/icwsm17_googlewikipedia.pdf.

MediaWiki. (2020a). *MediaWiki*. Wikipedia, the free encyclopedia, Wikipedia. <https://en.wikipedia.org/wiki/MediaWiki>.

MediaWiki. (2020b). *MediaWiki/Engine*. Wikiversity, Wikipedia. <https://en.wikiversity.org/wiki/MediaWiki/Engine>.

Oeberst, A., von der Beck, I., Cress, U., & Nestler, S. (2019). Wikipedia outperforms individuals when it comes to hindsight bias. *Psychological Research*, 84(6), 1517–1527. <https://doi.org/10.1007/s00426-019-01165-7>.

Oldman, D., Doerr, M., & Gradmann, S. (2015). Zen and the art of linked data. New strategies for a semantic web of humanist knowledge. In S. Schreibman, R. Siemens, & J. Unsworth (Eds.), *A new companion to digital humanities*. Wiley Online Library. <https://doi.org/10.1002/9781118680605.ch18>.

Parliament. (2020). *De Belgische regeringen. Historisch overzicht*. Kamer van volksvertegenwoordigers - Dienst Public relations en Internationale betrekkingen. https://www.dekamer.be/kvvcr/pdf_sections/pri/fiche/nl_17_01.pdf.

Pradel, F. (2020). Biased representation of politicians in Google and Wikipedia search? The joint effect of party identity, gender identity and elections. *Political Communication*. <https://doi.org/10.1080/10584609.2020.1793846>.

Rogers, R. (2013). *Digital methods*. The MIT Press.

Schroeder, R., & Taylor, L. (2015). Big data and Wikipedia research: Social science knowledge across disciplinary divides. *Information, Communication & Society*, 18(9), 1039–1056. <https://doi.org/10.1080/1369118X.2015.1008538>.

Statista. (2020). *Global internet penetration rate as of January 2020, by region*. Statista. <https://www.statista.com/statistics/269329/penetration-rate-of-the-internet-by-region/>.

Tkacz, N. (2015). *Wikipedia and the politics of openness*. University of Chicago Press.

Vincent, N., Johnson, I., & Hecht, B. (2018). *Examining Wikipedia with a broader lens: Quantifying the value of Wikipedia's relationships with other large-scale online*

communities. CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, paper 566, 1–13. <https://doi.org/10.1145/3173574.3174140>.

Wakabayashi, D. (2017, September 26). As Google fights fake news, voices on the margins raise alarm. *The New York Times*. <https://www.nytimes.com/2017/09/26/technology/google-search-bias-claims.html>.

Wikidata. (2020). *Wikipedia: Use of Wikidata in Wikipedia*. Wikipedia. https://en.wikipedia.org/wiki/Wikipedia:Use_of_Wikidata_in_Wikipedia.

Women in Red. (2020). *Wikipedia: WikiProject women in red*. Wikipedia. https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Women_in_Red.

APPENDIX 1

This appendix contains the tables with the data discussed in the article. The RHC-Belelite and Wikipedia lists of prime ministers are presented in Table 1a–b. For readability purposes, Figure 2 contains an explanatory example of the setup of the review of a biographical page (for the fictional page about ‘Albert Noniem’). The Wikipedia biography edit histories reviews are situated in Tables 2a–d (Van Acker), Tables 3a–d (Tindemans), Tables 4a–d (Wilmès). Timestamps provided in these tables were checked on December 10, 2020 with the following Wikipedia User Preferences: User profile | Language en-English, Appearance | Time offset Time zone: Wiki default (UTC). The reviews of Wikidata items are in Tables 5a–d.

Table 1a: comparison of lists of prime ministers in RHC-Belette and Wikipedia (1831–1945).

BELGIAN ROYAL HISTORICAL COMMISSION List of Belgian Governments 1831-1945				WIKIPEDIA Dutch Lijst van premiers van België 1831-1945				WIKIPEDIA French Liste des Premiers ministres de Belgique 1831-1945				WIKIPEDIA German Liste der Premierminister von Belgien 1831-1945				WIKIPEDIA English List of prime ministers of Belgium 1831-1945			
PM #	Government	In Office		Name van de Minister en Regeringsinstance	Ambtsstermijn (in Office)		PM #	Nom du Premier et Instance du Gouvernement	Mandat (in Office)		Anstimmhaber	Ambtszeit (in Office)		Prime Minister's Name	Government and Instance	In Office			
		From	To		Begin	Ende			Début	Fin		Antritt	Ende				Task office	Left office	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7		
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11		
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13		
14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14		
15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15		
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		
17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17		
18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19		
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20		
21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22		
23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23		
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24		
25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25		
26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26		
27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27		
28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28		
29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29		
30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32		
33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33		
34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34		
35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35		
36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36		
37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37		
38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38		
39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39		
40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41		
42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42		
43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43		
44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44		
45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45		
46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46		
47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47		
48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48		
49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49		
50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50		

Fig. 2: Explanatory example of the setup of the review of a biographical page.

AN.NL https://nl.wikipedia.org/wiki/Albert_Noniem (fictitious page for this example)					
AN.NL version at date@hour	Change occurs in	Le: edit	Text or Infobox change history	hyperlink active on WP.NL-AN at time of Text / Infobox change	
1 01-04-2010 @ 00:15	TEXT	fe	premier	no link a*	
2 15-04-2010 @ 07:30	TEXT	le	premier	EM (16-Jul-2005 20:54) b*	
3 16-04-2010 @ 18:16	INFOBOX	fe	42 st / 44 th / 51 st Premier van België	PB (15-Nov-2008 01:04) c*	
4 31-07-2020 @ 15:27	TEXT	le	premier van België	PB (23-Apr-2020 10:37)	
	INFOBOX	le	Premier van België	PB (23-Apr-2020 10:37)	

1	Reference to Wikipedia page (e.g. The Duch (NL) Wikipedia page of the biography of Albert Noniem)
	Each new row marks the change in the term designating the office holder in the language of the biography with regard to the version dated in the row above.
2	Date and time of Wikipedia page (e.g. AN.NL 01-04-2010 @ 00:15) can be found by flipping through the "Geschiedenis" pages of the Wikipedia biography of Albert Noniem. (e.g. The article AN.NL @ 00:15 does contain the term "premier". For historical prime ministers such as Van Acker and Tindemans this coincides with their first creation of their biographical Wikipedia article. Wilms had a biographical article on Wikipedia that created before she became Prime minister.)
3	Identifies if changes occur since the previous instance of the Wikipedia biography page in this table. It marks if the changes occur in the textual description or in the infobox
4	fe : first edit or le: last edit of either TEXT or INFOBOX
5	Occurrence of the term designating the office holder of Belgian prime minister in the language of the biography under review. The leftmost column AN.NL 01-04-2010 @ 00:15 indicates that a term "premier" was found in the text of the biography. When the term is in black font there is no hyperlink to another Wikipedia page.
6	The second reference in the present table references the version of the biography AN.NL 15-04-2010 @ 07:30 which has a change vis-avis the previous row. The colour indicates that a hyperlink was added to the term used to designate the office holder (in this case "premier"). The reference to the hyperlink also coloured is found in the rightmost column.
7	Sometimes there are additions (such as instance numbers or descriptions) which add information to the term used for the office holder. They are marked in dark blue.
8	Sometimes notes are added to the change history or hyperlinked Wikipedia pages to note particular issues.
9	The date and time of last update version before 31-07-2020 of the biography page with the text string designation of the officeholder in the text and the infobox in the language of the biography are presented here. The hyperlinks to the current hyperlinks are also provided.

Achiel Van Acker

AVA:NL = https://nl.wikipedia.org/wiki/Achiel_Van_Acker

Table 2a: Review of the Dutch Wikipedia biography of Achiel Van Acker.

	AVA:NL version at date@hour	Change occurs in	Unit	Text or Infobox change history	hyperlink active on AVA:NL at time of Text / Infobox change
a	17-04-2004 @ 12:08	TEXT	fc	premier	no link a*
b	23-04-2005 @ 01:27	TEXT		premier van België	no link b*
c	31-08-2005 @ 00:17	TEXT		premier	to EM:NL (16-07-2005 @ 19:54) c*
d	10-11-2008 @ 17:16	INFOBOX	fc	42 st / 44 st / 51 st Premier van België	to PB:NL (15-11-2008 @ 00:04) d*
e	31-12-2008 @ 14:18	INFOBOX		33st Premier van België	to PB:NL (30-12-2008 @ 19:28) e*
				Premier van België	to PB:NL (30-12-2008 @ 19:28)
				Premier (België)	no link
f	15-01-2009 @ 18:14	INFOBOX		Premier van België (3 identical hyperlinks)	to PB:NL (31-12-2008 @ 14:45)
g	11-04-2009 @ 13:29	INFOBOX		42 st / 44 st / 51 st Premier van België	to PB:NL (31-12-2008 @ 14:45)
h	10-10-2014 @ 13:33	INFOBOX		Premier van België (3 identical hyperlinks)	to PB:NL (09-10-2014 @ 09:38)
i	09-03-2020 @ 14:39	TEXT		premier van België	to PB:NL (23-04-2020 @ 09:37)
j	17-06-2020 @ 13:35	TEXT	lc	premier van België	to PB:NL (23-04-2020 @ 09:37)
		INFOBOX	lc	Premier van België (3 identical hyperlinks)	to PB:NL (23-04-2020 @ 09:37)

EM:NL refers to Dutch Wikipedia page: “Eerste minister” https://nl.wikipedia.org/wiki/Eerste_minister

PB:NL refers to Dutch Wikipedia page: “Premier van België” https://nl.wikipedia.org/wiki/Premier_van_België

a* b* The text strings “premier” and “premier van België” were not hyperlinked to another Wikipedia page before (AVA:NL 31-08-2005 @ 01:17)

c* The text string “premier” is hyperlinked to the Dutch Wikipedia page explaining the term of “Eerste minister” by putting it in contrast with regional Belgium practices of “minister-president” and the term used for the leader of the Dutch government (minister-president).

d* The prefix instances to the string “Premier van België”, (42, 44 and 51) are not hyperlinked to a Wikipedia list. The string “Premier van België” is linked here to Dutch: “Premier van België” which offers a description of the function of “Eerste minister” but no listing of instances of Belgian governments or Prime Ministers. It is therefore impossible to verify these numbers of the instancing.

e* The infobox of AVA:NL 31-12-2008 @ 15:45 refers to Achille Van Acker as “33st Premier van België”. This is coherent with the present instance numbering in RHC-Belelite and the Wikipedia information in Table 1b.

Achille Van Acker

AVA:FR = https://fr.wikipedia.org/wiki/Achille_van_Acker

Table 2b: Review of the French Wikipedia biography of Achille Van Acker.

AVA:FR version at date@hour		Change occurs in	Unit	Text or Infobox change history	hyperlink active on AVA:FR at time of Text / Infobox change
a	05-11-2005 @ 16:13	TEXT	fe	Premier ministre	no link
b	16-06-2011 @ 12:02	INFOBOX	fe	23e Premier ministre belge a* (51e chef du gouvernement)	LPB:FR (19-05-2011 @ 08:27) a*
			fe	16e Premier ministre belge a* (44e chef du gouvernement)	LPB:FR (19-05-2011 @ 08:27) a*
			fe	14e Premier ministre belge a* (42e chef du gouvernement)	LPB:FR (19-05-2011 @ 08:27) a*
c	30-10-2012 @ 23:27	INFOBOX		14e, 16e et 23e Premier ministre belge (42e, 44e et 51e chef du gouvernement)	LPB:FR (10-09-2012 @ 15:36)
d	23-09-2018 @ 19:57	TEXT		Premier ministre	PB:FR (19-09-2018 @ 19:49)
e	03-11-2018 @ 23:41	INFOBOX		Premier ministre belge	LPB:FR (04-11-2018 @ 22:20)
f	12-06-2020 @ 18:05	TEXT	le	Premier ministre	PB:FR (01-06-2020 @ 17:24)
		INFOBOX	le	Premier ministre belge	LPB:FR (11-05-2020 @ 12:29)

LPB:FR refers to French Wikipedia page: “Liste des Premiers ministres de Belgique” https://fr.wikipedia.org/wiki/Liste_des_Premiers_ministres_de_Belgique

PB:FR refers to French Wikipedia page: “Premier ministre de Belgique” https://fr.wikipedia.org/wiki/Premier_ministre_de_Belgique

a* in the French Wikipedia article “Liste des Premiers ministres de Belgique” of (LPB:FR 19-May-2011 @ 08:27) the numbering of politicians holding the function of Belgian Prime Minister is divided into two tables (before and after 21 November 1918; or Belgian governments before and after the end of the first World War).

Achille Van Acker

AVA:DE = https://de.wikipedia.org/wiki/Achille_Van_Acker

Table 2c: Review of the German Wikipedia biography of Achille Van Acker.

	AVA:DE version at date@hour	Change occurs in	Left	Text or Infobox change history	hyperlink active on AVA:DE at time of Text / Infobox change
a	18-02-2007 @ 09:36:00	TEXT	fe	Premierminister	no link
b	22-02-2020 @ 16:47:00	TEXT	le	Premierminister	no link

Wikipedia pages hyperlinked to “Premierminister” on AVA:DE: **None**

Achiel Van Acker

AVA:EN = https://en.wikipedia.org/wiki/Achille_Van_Acker

Table 2d: Review of the English Wikipedia biography of Achille Van Acker.

	AVA:EN version at date@hour	Change occurs in	Left	Text or Infobox change history	hyperlink active on AVA:EN at time of Text / Infobox change
a	21-02-2006 @ 09:10	TEXT	fe	Prime Minister	to PM-function (20-02-2006 @ 10:47)
b	28-02-2006 @ 00:15	TEXT		Prime Minister of Belgium	to PM-function (26-02-2006 @ 06:08)
c	03-02-2010 @ 18:50	TEXT		33 th Prime Minister of Belgium c*	to LPM:EN list moved (19-07-2010) to PM:EN (02-02-2010 @ 00:58)
d	03-09-2011 @ 19:37	INFOBOX	fe	Prime Minister of Belgium	to PM:EN (29-07-2011 @ 01:08)
e	07-01-2017 @ 23:23	TEXT		Prime Minister of Belgium	to LPM:EN (05-10-2016 @ 21:24) which is redirected to PMB#KB which in turn links to LPM:EN (05-10-2016 @ 22:30) !
f	27-03-2017 @ 05:39	INFOBOX		33 th Prime Minister of Belgium f*	to PM:EN (17-03-2017 @ 16:09)
g	04-02-2020 @ 23:12	TEXT	le	Prime Minister of Belgium	LPM:EN (12-01-2020 @ 14:54)
		INFOBOX	le	33 rd Prime Minister of Belgium g*	PM:EN (16-05-2020 @ 04:00) g*

PM-function refers to English Wikipedia page: “Prime minister” https://en.wikipedia.org/wiki/Prime_minister

LPM:EN refers to English Wikipedia page: “List of prime ministers of Belgium” https://en.wikipedia.org/wiki/List_of_prime_ministers_of_Belgium

PMB#KB refers to English Wikipedia page: “List of prime ministers of Belgium”

https://en.wikipedia.org/w/index.php?title=List_of_prime_ministers_of_Belgium&oldid=742798298

PM:EN refers to English Wikipedia page: “Prime Minister of Belgium”
https://en.wikipedia.org/wiki/Prime_Minister_of_Belgium

The last current instance of (AVA:EN 04-02-2020 @ 23:12) states in its introductory paragraph that Achille Van Acker “was a Belgian politician who served 3 terms as Prime Minister of Belgium”. Van Acker was Prime Minister of 4 governments of which the first 2 are considered separate government cabinets (Van Acker I and Van Acker II) but as Van Acker II is the immediate successor of Van Acker I Wikipedia considers these first two governments as 1 term as Prime Minister since there was no other Prime minister between Van Acker I and Van Acker II. Therefore LPM:EN credits Van Acker with 3 terms as Prime Ministers in 4 governments cabinets (also see Table 1b).

c* f* g* (LPM:EN 02-02-2010 @ 00:58) does give instance numbers to individual prime ministers, counting each individual uninterrupted premiership as 1 instance. This counting makes Achille Van Acker the 33th of Belgium since 1831. Although (AVE:EN 27-03-2017 @ 05:39) does state that Achille Van Acker is the 33th Belgian Prime minister no hyperlink from the infobox specific to the instance is provided.

Leo Tindemans

LT:NL = https://nl.wikipedia.org/wiki/Leo_Tindemans

Table 3a: Review of the Dutch Wikipedia biography of Leo Tindemans.

LT:NL version at date@hour	Change occurs in	Unit	Text or Infobox change history	hyperlink active on LT:NL at time of Text / Infobox change
a 28-03-2004 @ 19:06	TEXT	fe	eerste minister	no hyperlink
b 15-03-2005 @ 08:41	TEXT		eerste minister	MP b*
c 05-04-2007 @ 23:48	TEXT		eerste minister	EM:NL (02-04-2007 @ 19:01)
d 10-11-2008 @ 17:43	INFOBOX	fe	58 st Premier van België d*	PB:NL (21-05-2008 @ 21:44)
e 31-12-2008 @ 14:24	INFOBOX	ch	43 st Premier van België e*	PB:NL (30-12-2008 @ 19:28)
f 11-04-2009 @ 13:34	INFOBOX	ch	58 st Premier van België f*	PB:NL (30-12-2008 @ 19:28)
g 10-10-2014 @ 13:37	INFOBOX	ch	Premier van België	PB:NL (09-10-2014 @ 09:38)
h 09-11-2019 @ 09:45	TEXT	le	eerste minister	EM:NL (26-01-2016 @ 09:54)
	INFOBOX	le	Premier van België	PB:NL (27-10-2019 @ 20:56)

EM:NL refers to Dutch Wikipedia page: “Eerste minister” https://nl.wikipedia.org/wiki/Eerste_minister

PB:NL refers to Dutch Wikipedia page: “Premier van België” https://nl.wikipedia.org/wiki/Premier_van_België

b* On 16-02-2007 @ 13:01 The Wikipedia page of “Minister-president” was changed to Minister-president van Nederland through “Reorganisation of Dutch Wikipedia language pages of Minister-President, Premier, Eerste-Minister”. The Wikipedia page WP:NL “Eerste Minister” existed since 24-04-2005. According the View History (Dutch: Geschiedenis) tab of LT:NL to the hyperlink of the term “eerste minister” to “minister-president” was active from (LT:NL 15-03-2005 @ 08:41) until it was changed on (LT:NL 05-04-2007 @ 23:48) into a hyperlink connecting to (EM:NL 02-04-2007 @ 19:01).

d* e* f* In the infobox of the Wikipedia biographies of these dates the instance numbers 58, 43, 58 do not have a hyperlink to a listing of Belgian prime ministers. However, when comparing the Dutch Wikipedia version of the list of Belgian prime ministers (LPM:NL 09-11-2008 @ 13:29) having a date/time stamp just before (LT:NL 10-11-2008 @ 17:43) Tindemans is listed as 58th “Premier van België”.

Leo Tindemans

LT:FR = https://fr.wikipedia.org/wiki/Leo_Tindemans

Table 3b: Review of the French Wikipedia biography of Leo Tindemans.

	LT:FR version at date@hour	Change occurs in	lt to	Text or Infobox change history	hyperlink active on LT:FR at time of Text / Infobox change
a	13-07-2004 @ 18:48	TEXT	fe	premier ministre	no hyperlink
b	17-09-2011 @ 12:17	INFOBOX	fe	^{30*} Premier ministre belge b* (58 ^e chef du gouvernement)	LPB:FR (29-06-2011 @ 17:35) b*
c	14-06-2017 @ 15:33	INFOBOX		Premier ministre belge	LPB:FR (11-05-2017 @ 11:15)
d	18-06-2020 @ 11:50	TEXT	le	Premier ministre	no hyperlink
		INFOBOX	le	Premier ministre belge	LPB:FR (29-07-2020 @ 20:48)

LPB:FR refers to French Wikipedia article: “Liste des Premiers ministres de Belgique” https://fr.wikipedia.org/wiki/Liste_des_Premiers_ministres_de_Belgique

b* (**LPB:FR** 29-06-2011 @ 17:35) splits its listing in two parts (before and after 1918). The instance ranking counts each continuous holder of the office of Belgian Prime minister as an entry in the list. Counting as such makes Tindemans the 30th Belgian Prime Minister. The instance number as “chef du gouvernement” 58e has no hyperlink.

Leo Tindemans

LT:DE = https://de.wikipedia.org/wiki/Leo_Tindemans

Table 3c: Review of the German Wikipedia biography of Leo Tindemans.

	LT:DE version at date@hour	Change occurs in	URL	Text or Infobox change history	hyperlink active on lt:DE at time of Text / Infobox change
a	24-07-2004 @ 12:29	TEXT	fe	Premierminister	redirected to PM:DE (28-06-2004 @ 13:20) a*
b	11-04-2020 @ 06:07	TEXT	le	Premierminister	redirected to PM:DE (27-03-2020 @ 189:57) b*

PM:DE refers to German Wikipedia page: “Ministerpräsident” <https://de.wikipedia.org/wiki/Premierminister> redirects to <https://de.wikipedia.org/wiki/Ministerpr%C3%A4sident>

a* This Wikipedia page only refers to the use of the nomenclature of “Ministerpräsident” in Germany.

b* This Wikipedia page specifies the differences in nomenclature of Belgian federal office holders (niederländisch: “Eerste Minister”, französisch: “Premier ministre”, deutsch: “Premierminister”) and the nomenclature used at Belgian regional or community level (niederländisch: “Minister-president”, französisch: “ministre-président”, deutsch: “Ministerpräsident”).

Leo Tindemans

LT:EN = https://en.wikipedia.org/wiki/Leo_Tindemans

Table 3d: Review of the English Wikipedia biography of Leo Tindemans.

	LT:EN version at date@hour	Change occurs in	edit	Text or Infobox change history	hyperlink active on LT:EN at time of Text / Infobox change
a	05-07-2004 @ 08:15	TEXT	fe	prime minister	no link
b	18-05-2007 @ 10:46	INFOBOX	fe	42nd Prime Minister of Belgium	PB:EN (27-02-2007 @ 05:36) b*
c	03-02-2010 @ 19:06	TEXT		43rd Prime Minister	PB:EN (02-02-2010 @ 00:58)
d	03-09-2011 @ 17:59	INFOBOX		Prime Minister of Belgium	PB:EN (29-07-2011 @ 01:08)
e	09-12-2016 @ 02:25	INFOBOX		43rd Prime Minister of Belgium	PB:EN (07-12-2016 @ 14:55) e*
f	09-07-2020 @ 06:39	TEXT	le	43rd Prime Minister of Belgium	PB:EN (16-05-2020 @ 04:00)
		INFOBOX	le	43rd Prime Minister of Belgium f*	PB:EN (16-05-2020 @ 04:00)

PB:EN refers to the English Wikipedia page of: “Prime Minister of Belgium”
https://en.wikipedia.org/wiki/Prime_Minister_of_Belgium

b* As marked in the biography of Tindemans of (LT:EN 18-05-2007 @ 10:46) his instance ranking in the List of Belgian prime ministers is 42nd. As is shown in the table below this is the result of concatenating the premierships of B.T. de Theux de Meylandt (note the different name spelling with previous tables in this thesis) and Jules Malou into one government with Jules Malou as sole Prime minister. The same concatenation happens in (LPM:NL 31-12-2008 @ 14:07). Note the different first names of de Theux de Malou (B.T. versus Barthélèmy) and of Frère-Orban (Hubert versus Walthère). The difference with (LPM:NL 31-12-2008 @ 14:07) is attributable to (LPM:EN 27-02-2007 @ 05:36) using 0 as the first number for the ranking of instances of Belgian governments since 1831

e* Although the infobox on the biography page of Tindemans (LT:EN 09-12-2016 @ 02:25) does add after 5 years the instance ranking of 43rd to Tindemans as Belgian Prime minister (albeit started counting with the first new Belgian government Delacroix government after World War I) this does not correspond with the order on the hyperlinked page from the term “Prime Minister of Belgium” (PB:EN: 07-12-2016 @ 14:55) because (a) no ranking is available on this page and (b) when calculating the ranking manually Tindemans has ranking number 30. No ranking instance number is ever given next to the listing of Belgian Prime Ministers on PB:EN.

f* Although the infobox does attribute the 43rd instance of Belgian Prime minister to Tindemans it does not hyperlink the instance number whereas

in the biographical text the number is hyperlinked to LPM:EN where no instance number is available either.

Sophie Wilmès

SW:NL = https://nl.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

Table 4a: Review of the Dutch Wikipedia biography of Sophie Wilmès.

SW:NL version at date@hour	Change occurs in	Edit	Text or Infobox change history	hyperlink active on SW:NL at time of Text / Infobox change
a	16-10-2014 @ 16:06	TEXT		Not Applicable
b	26-10-2019 @ 20:17	TEXT	vervangt eerste minister	no link
		TEXT	wordt ze de eerste vrouwelijke premier	no link
c	27-10-2019 @ 12:33	TEXT	zou ze de eerste vrouwelijke premier van België worden	no link
d	27-10-2019 @ 14:37	TEXT	werd zij de eerste vrouwelijke eerste minister van België	no link
d	27-10-2019 @ 16:10	INFOBOX	Premier van België	no link
d	27-10-2019 @ 16:15	INFOBOX	Premier Van België	PB:NL (27-10-2019 @ 07:43)
e	13-07-2020 @ 19:20	TEXT	premier	PB:NL (14-05-2020 @ 19:29)
		INFOBOX	Premier van België	

PB:NL refers to the Dutch Wikipedia page “Premier van België” https://nl.wikipedia.org/wiki/Premier_van_België

Sophie Wilmès

SW:FR: https://fr.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

Table 4b: Review of the French Wikipedia biography of Sophie Wilmès.

SW:FR version at date@hour	Change occurs in	Edit	Text or Infobox change history	hyperlink active on SW:FR at time of Text / Infobox change
a	04-01-2015 @ 13:10			Not Applicable
b	26-10-2019 @ 19:46	TEXT	première ministre	no link
c	26-10-2019 @ 22:30	INFOBOX	Première ministre de Belgique (designée)	PMB:FR (20-12-2018 @ 18:52) c*
			54e Législature c**	LCRB54 (16-10-2019 @ 15:24)
d	27-10-2019 @ 10:35	TEXT	Première ministre par intérim	PMB:FR (29-12-2018 @ 18:52) d*
e	27-10-2019 @ 17:33	INFOBOX	Première ministre de Belgique	PMB:FR (29-12-2018 @ 18:52) e*
f	27-10-2019 @ 17:49	TEXT	Première ministre	PMB:FR (27-10-2019 @ 17:42) f*
g	27-10-2019 @ 17:49 (2)	INFOBOX	55e Législature h*	LCRB55 (23-10-2019 @ 22:23)
h	30-07-2020 @ 23:57	TEXT	Première ministre de Belgique	PMB:FR (24-07-2020 @ 13:43)
		INFOBOX	Première ministre de Belgique	LCRB55 (18-07-2020 @ 16:56)

PMB:FR refers to the French Wikipedia page “Premier ministre de Belgique” https://fr.wikipedia.org/wiki/Premier_ministre_de_Belgique

LCRB54 refers to “54e législature de la Chambre des représentants de Belgique” https://fr.wikipedia.org/54e_législature_de_la_Chambre_des_représentants_de_Belgique

LCRB55 refers to “55e législature de la Chambre des représentants de Belgique” https://fr.wikipedia.org/55e_législature_de_la_Chambre_des_représentants_de_Belgique

c* d* e* does not reflect the change in Prime minister. The next update of (LPB:FR 27-10-2019 @ 18:42) does.

c** the term “Législature” refers to the elected members of the Chamber of Representatives of Belgium. The 54th installment is the result of the Belgian legislative elections of 25 May 2014. Législature 55 results from the Belgian legislative elections of 20 June 2019. This differs from linking prime ministers to the governments they lead. It does however mean that one legislative assembly can be linked to two prime ministers, as is the case of Michel and Wilmès as they both are prime ministers of the 54th Belgian legislative assembly.

Sophie Wilmès

SW:DE = https://de.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

Table 4c: Review of the German Wikipedia biography of Sophie Wilmès.

	SW:DE version at date@hour	Change occurs in	edit	Text or Infobox change history	hyperlink active on SW:DE at time of Text / Infobox change
a	28-10-2019 @ 00:33	TEXT	fe	geschäftsführende Ministerpräsidentin a*	LPB:DE (27-10-2019 @ 18:13)
b	19-03-2020 @ 21:24	TEXT		ordentliche Ministerpräsidentin b*	LPB:DE (28-10-2019 @ 05:55)
c	12-04-2020 @ 14:55	TEXT		ordentliche Premierministerin c*	LPB:DE (28-10-2019 @ 05:55)
d	07-06-2020 @ 06:10	TEXT	le	ordentliche Premierministerin	LPB:DE (26-04-2020 @ 12:21)

LPB:DE refers to the German Wikipedia page: “Ministerpräsident” https://de.wikipedia.org/wiki/Liste_der_Premierminister_von_Belgien

The German Wikipedia biography page of Wilmès has never provided summary infoboxes.

a* b* c* These biography pages do present 3 combinations of descriptions of the naming of the office holder of Belgian Prime minister and its political/legal status:

(a*) geschäftsführende Ministerpräsidentin [EN: acting minister-president(in)]

(b*) ordentliche Ministerpräsidentin [EN: ordinary minister-president(in)]

(c*) ordentliche Premierministerin [EN: ordinary prime minister(in)]

Sophie Wilmès

SW:EN https://en.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

Table 4d: Review of the English Wikipedia biography of Sophie Wilmès.

SW:EN version at date@hour	Change occurs in	Unit	Text or Infobox change history	hyperlink active on SW:EN at time of Text / Infobox change
a	30-07-2016 @ 05:23	TEXT		Not Applicable
b	26-10-2019 @ 21:20	TEXT	fe interim prime minister	no link
c	26-10-2019 @ 22:11	INFOBOX	fe Prime Minister Minister of Belgium (Designate) c*	PMMB (page does not exist)
d	26-10-2019 @ 22:12	INFOBOX	Prime Minister of Belgium (Designate) *d	PB:EN (31-08-2019 @ 17:49)
e	27-10-2019 @ 10:09	TEXT	Prime Minister of Belgium	PB:EN (31-08-2019 @ 17:49)
f		INFOBOX	Prime Minister of Belgium (Incumbent)	PB:EN (31-08-2019 @ 17:49)
g	20-11-2019 @ 02:57	INFOBOX	52nd Prime Minister of Belgium (Incumbent)	PB:EN (13-12-2019 @ 18:59)
h	30-05-2020 @ 11:39	TEXT	Prime Minister of Belgium (Incumbent)	PB:EN (16-05-2020 @ 04:00)
		INFOBOX	52nd Prime Minister of Belgium (Incumbent)	

PMMB: Wikipedia page does not exist (probably typographic error of Wikipedia editor) https://en.wikipedia.org/wiki/Prime_Minister_Minister_of_Belgium

PB:EN refers to English Wikipedia page “Prime minister of Belgium” https://en.wikipedia.org/wiki/Prime_Minister_of_Belgium

c* the English Wikipedia page of “Sophie Wilmès” dated (SW:EN 26-Oct-2019 @ 22:12) states that she will assume office (designate) on 1 December 2019.

d* the English Wikipedia page of “Sophie Wilmès” dated (SW:EN 27-Oct-2019 @ 10:09) states that she has assumed office (incumbent) on 27 October 2019.

Table 5a: Comparison between results of Wikidata SPARQL queries and Wikipedia lists of Belgian prime ministers by continuous mandate.

List of Belgian Prime ministers 1831 - 1918										List of Belgian Prime ministers 1918 - 1945											
WIKIDATA QUERY SERVICE										WIKIDATA QUERY SERVICE											
SPARQL Query "List of Belgian Prime Ministers office holders"										SPARQL Query "List of Belgian Prime Ministers office holders"											
Prime Minister		Prime Minister		Office holding		Wikidata entity	Name	start	end	added instance number	instance number	WP:EN:LPB		Wikidata entity	Name	start	end	added instance number	instance number	WP:EN:LPB	
Wikidata entity	Name	start	end	Prime Minister Name	Prime Minister Name																
Q289570	de Gerlache	27-02-1831	10-03-1831	1	1	de Gerlache	Q719483	Cooreman	01-06-1918	21-11-1918	28	28	Cooreman								
Q485104	Lebeau	10-03-1831	24-07-1831	2	2	Lebeau	Q14989	Delacroix	21-11-1918	20-11-1920	29	29	Delacroix								
Q472278	De Muelenaere	24-07-1831	20-10-1832	3	3	De Muelenaere	Q14900	Carton de Wiart	20-11-1920	16-12-1921	30	30	Carton de Wiart								
Q533339	Goblet d'Alviella	20-10-1832	04-08-1834	4	4	Goblet d'Alviella	Q14901	Theunis	16-12-1921	13-05-1925	31	31	Theunis								
Q472257	de Theux de Meylandt	04-08-1834	18-04-1840	5	5	de Theux de Meylandt	Q14902	Van de Vyvere	13-05-1925	17-06-1925	32	32	Van de Vyvere								
Q485104	Lebeau	18-04-1840	13-04-1841	6	6	Lebeau	Q14903	Poulet	17-06-1925	08-05-1926	33	33	Poulet								
Q446472	Nothomb	13-04-1841	30-07-1845	7	7	Nothomb	Q14904	Jaspas	20-05-1926	08-06-1931	34	34	Jaspas								
Q546727	Van de Weyer	30-07-1845	31-03-1846	8	8	Van de Weyer	Q14905	Rensin	08-06-1931	22-10-1932	35	35	Rensin								
Q472257	De Theux de Meylandt	31-03-1846	12-08-1847	9	9	De Theux de Meylandt	Q705103	De Broqueville	22-10-1932	20-11-1934	36	36	De Broqueville								
Q485109	Rogier	12-08-1847	31-10-1852	10	10	Rogier	Q14901	Theunis	20-11-1934	25-03-1935	37	37	Theunis								
Q527479	De Broeckère	31-10-1852	30-03-1855	11	11	De Broeckère	Q14906	van Zeeland	25-03-1935	24-11-1937	38	38	van Zeeland								
Q143202	De Decker	30-03-1855	09-11-1857	12	12	De Decker	Q685905	Janson	24-11-1937	18-05-1938	39	39	Janson								
Q485109	Rogier	09-11-1857	03-01-1868	13	13	Rogier	Q155691	Spaak	18-05-1938	22-03-1939	40	40	Spaak								
Q705791	Frère-Orban	03-01-1868	02-07-1870	14	14	Frère-Orban	Q442578	Pierlot	22-03-1939	12-03-1945	41	41	Pierlot								
Q725589	D'Anethan	02-07-1870	07-12-1871	15	15	D'Anethan	Q14907	Van Acker	12-03-1945	13-03-1946	42	42	Van Acker								
Q472257	De Theux de Meylandt	07-12-1871	21-08-1874	16	16	De Theux de Meylandt	Q155691	Spaak	13-03-1946	31-03-1946	43	43	Spaak								
Q678535	Malou	21-08-1874	19-06-1878	17	17	Malou	Q14907	Van Acker	31-03-1946	03-03-1946	44	44	Van Acker								
Q705791	Frère-Orban	19-06-1878	15-06-1884	18	18	Frère-Orban	Q14908	Huysemans	03-03-1946	20-03-1947	45	45	Huysemans								
Q678535	Malou	15-06-1884	25-10-1884	19	19	Malou	Q155691	Spaak	20-03-1947	11-03-1949	46	46	Spaak								
Q202049	Beernaert	25-10-1884	25-03-1894	20	20	Beernaert	Q14909	G. Eyskens	11-03-1949	08-06-1950	47	47	G. Eyskens								
Q599138	De Burlet	25-03-1894	25-02-1895	21	21	De Burlet	Q491703	Duwaert	08-06-1950	16-03-1950	48	48	Duwaert								
Q721781	De Smet de Naeyer	25-02-1896	24-01-1899	22	22	De Smet de Naeyer	Q705111	Pholien	16-03-1950	15-01-1952	49	49	Pholien								
Q721772	Vanderpeereboom	24-01-1899	05-08-1899	23	23	Vanderpeereboom	Q705128	Van Houtte	15-01-1952	23-04-1954	50	50	Van Houtte								
Q721781	De Smet de Naeyer	05-08-1899	02-05-1907	24	24	De Smet de Naeyer	Q14907	Van Acker	23-04-1954	28-06-1958	51	51	Van Acker								
Q721768	De Trooz	02-05-1907	31-12-1907	25	25	De Trooz	Q14909	G. Eyskens	28-06-1958	25-04-1961	52	52	G. Eyskens								
Q15656	Schollaert	06-01-1908	17-06-1911	26	26	Schollaert	Q221781	Lefèvre	25-04-1961	28-01-1965	53	53	Lefèvre								
Q705103	De Broqueville	17-06-1911	01-06-1918	27	27	De Broqueville	Q303942	Hamel	28-07-1965	19-03-1968	54	54	Hamel								
							Q250021	Vanden Boeynants	19-03-1968	17-06-1968	55	55	Vanden Boeynants								
							Q14909	G. Eyskens	17-06-1968	26-01-1973	56	56	G. Eyskens								
							Q14909	G. Eyskens	17-07-1968	26-01-1973	57	1	G. Eyskens								
							Q491745	Leburton	26-01-1973	25-04-1974	58	57	Leburton								
							Q15002	Tindemans	25-04-1974	20-10-1978	59	58	Tindemans								
							Q250021	Vanden Boeynants	20-10-1978	03-04-1979	60	60	Vanden Boeynants								
							Q250021	Vanden Boeynants	20-10-1978	03-03-1979	61	2	Vanden Boeynants								
							Q13309	Martens	03-04-1979	31-03-1981	62	60	Martens								
							Q349477	M. Eyskens	31-03-1981	17-12-1981	63	3	M. Eyskens								
							Q349477	M. Eyskens	06-04-1981	17-12-1981	64	4	M. Eyskens								
							Q13309	Martens	17-12-1981	07-03-1982	65	62	Martens								
							Q15056	Dehaene	07-03-1982	12-07-1989	66	63	Dehaene								
							Q12978	Vanhofstadt	12-07-1989	20-03-2008	67	64	Vanhofstadt								
							Q12981	Leterme	20-03-2008	30-12-2008	68	65	Leterme								
							Q12983	Van Rompuy	30-12-2008	25-11-2009	69	66	Van Rompuy								
							Q12981	Leterme	25-11-2009	06-12-2011	70	67	Leterme								
							Q15048	Di Rupo	06-12-2011	11-10-2014	71	68	Di Rupo								
							Q850508	Michel	11-10-2014	17-10-2019	72	69	Michel								
											70	70	Sophie Wilmès								
							Q18434995	Wilmès	27-10-2019	-	-	-	-	-	-	-	-	-	-	-	-

Table 5b: Examples of inconsistencies between Wikidata and Wikipedia for Vanden Boeynants-Eyskens.

inconsistent data	WIKIDATA QUERY SERVICE					WIKIPEDIA LIST OF BELGIAN PRIME MINISTERS					RHC - Belette				
	SPARQL Query "List of Belgian Prime Ministers office holders"					LP:NL	LP:FR	Office holding		LP:DE	LP:EN	Office holding			
	Prime Minister		Office holding					start	end			start	end	start	end
	Wikidata entity	Name	start	end	end	start	end	start	end	start	end				
	Q250021	Paul Vanden Boeynants		17-06-1968		VGB I	VGB I	17-07-1968		VGB I	VGB I	17-07-1968		17-06-1968	
a	Q14999	Gaston Eyskens	17-06-1968	26-01-1973		GE V, VI	GE V	17-07-1968	26-01-1973	GE	GE V, VI	17-07-1968	26-01-1973	17-06-1968	26-01-1973
b	Q14999	Gaston Eyskens	17-07-1968	26-01-1973											

consistent with start date of 17-06-1979
 consistent with start date of 17-07-1990

Table 5c: Examples of inconsistencies between Wikidata and Wikipedia for Vanden Boeynants-Martens.

Inconsistent data	WIKIDATA QUERY SERVICE				WIKIPEDIA LIST OF BELGIAN PRIME MINISTERS						RHC - Belette							
	SPARQL Query "List of Belgian Prime Ministers office holders"								LPM:NL	LPM:FR	Office holding		LPM:DE	LPM:EN	Office holding		Office holding	
	Prime Minister		Office holding		start	end	start	end			start	end			start	end		
	Wikidata entity	Name	start	end														
a	Q250021	Paul Vanden Boeynants		03-04-1979	VdB II	VdB II		03-03-1979	VdB II	VdB II		03-04-1979				03-04-1979		
b	Q250021	Paul Vanden Boeynants		03-03-1979								03-03-1979			03-04-1979			
	Q313809	Wilfried Martens	03-04-1979		M I	M I	03-03-1979				03-03-1979			03-04-1979				

consistent with start date of 03-04-1979

consistent with start date of 03-03-1979

Table 5d: Examples of inconsistencies between Wikidata and Wikipedia for Martens-Eyskens.

Inconsistent data	WIKIDATA QUERY SERVICE				WIKIPEDIA LIST OF BELGIAN PRIME MINISTERS						RHC - Belette							
	SPARQL Query "List of Belgian Prime Ministers office holders"								LPM:NL	LPM:FR	Office holding		LPM:DE	LPM:EN	Office holding		Office holding	
	Prime Minister		Office holding		start	end	start	end			start	end			start	end		
	Wikidata entity	Name	start	end														
	Q313809	Wilfried Martens		06-04-1981	M IV	M IV		31-03-1981	M IV	M IV		31-03-1981				06-04-1981		
a	Q349477	Mark Eyskens	31-03-1981		ME I	ME I	31-03-1981		ME I	ME I	31-03-1981			06-04-1981				
b	Q349477	Mark Eyskens	06-04-1981															

Figure 3a: Side-by-side comparison of the different language versions of the biographical page of Sophie Wilmès (SW:NLx 2020, SW:FRx 2020, snapshots show the last available revisions for July 2020).

Sophie Wilmès

Dit is een **nieuwe versie** van deze pagina, basierend op de laatste wijziging op 13 oktober 2020. U kunt de vorige versie bekijken op de pagina [versie 1](#). Het is mogelijk dat de inhoud van deze pagina is gewijzigd. Het is mogelijk dat de inhoud van deze pagina is gewijzigd. Het is mogelijk dat de inhoud van deze pagina is gewijzigd.

Sophie Wilmès (Brussel, 14 januari 1975) is een Belgisch politicus van de MR. Zij is 27 oktober 2019 voor de eerste keer verkozen tot premier van België.

Levensloop

Wilmès is een dochter van Minister van Financiën Philippe Van Parijs, geboren in een klein dorpje in de provincie Waas. Ze werd geboren op 14 januari 1975 in Brussel. Ze is getrouwd met de advocaat en politicus Jean-Philippe Van Parijs. Ze heeft twee kinderen, een zoon en een dochter.

Wilmès groeide op in een klein dorpje in de provincie Waas. Ze werd geboren op 14 januari 1975 in Brussel. Ze is getrouwd met de advocaat en politicus Jean-Philippe Van Parijs. Ze heeft twee kinderen, een zoon en een dochter.

Minister van Begroting

Op 21 oktober 2010 werd Wilmès benoemd tot minister van Begroting in de regering-Leterme. Ze was de eerste vrouwelijke minister van Begroting in België. Ze bleef in deze functie tot 22 oktober 2011, toen de regering-Leterme werd ontbonden.

Premier van België

Op 17 oktober 2019 werd Wilmès benoemd tot premier van België. Ze werd de eerste vrouwelijke premier van België. Ze bleef in deze functie tot 22 oktober 2020, toen de regering-Wilmès werd ontbonden.

Uitslagen verkiezingen

Vereniging	Kandidaat	Datum	Lijst	Plaats op lijst	Voortvansommen	Uitslag	Percentage binnen kieskring
Senatorsverkiezingen	MR-Vereniging	2005	CD-20	2e plaats	802	2e	23,54%
Provincialeverkiezingen	MR-Vereniging	1 oktober 2009	LF	20e plaats	1.077	26	14,41%
Senatorsverkiezingen	MR-Vereniging	2010	CD-20	2e plaats	1.339	26	40,53%
Parlementaireverkiezingen	MR-Vereniging	13 oktober 2010	LF	1e plaats	3.000	1e	30,4%
Parlementaireverkiezingen	MR-Vereniging	20 september 2019	MR	2e plaats	15.100	2e	17,47%

Personlijk

Wilmès is getrouwd met Jean-Philippe Van Parijs. Ze heeft twee kinderen, een zoon en een dochter.

Worpleiding

- 2015-2019: Minister van Begroting
- 2010-2011: Minister van Financiën
- 2005-2009: Minister van Financiën
- 2001-2005: Minister van Financiën
- 1999-2001: Minister van Financiën

Partij

- 2015-2019: MR
- 2010-2011: MR
- 2005-2009: MR
- 2001-2005: MR
- 1999-2001: MR

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Commissies

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Sophie Wilmès

Carrière en politieke carrière van Sophie Wilmès, geboren op 14 januari 1975 in Brussel. Ze is 27 oktober 2019 voor de eerste keer verkozen tot premier van België.

Sophie Wilmès (Brussel, 14 janvier 1975) est une femme politique belge. Elle est devenue ministre de la Région wallonne le 21 octobre 2010 et ministre de la Région wallonne le 17 octobre 2019. Elle est devenue première ministre de la Région wallonne le 17 octobre 2019.

Levensloop

Wilmès est une fille de Philippe Van Parijs, ministre des Finances. Elle est née à Bruxelles le 14 janvier 1975. Elle est mariée à Jean-Philippe Van Parijs. Elle a deux enfants, un garçon et une fille.

Wilmès a grandi dans un petit village de la province de Waas. Elle est née le 14 janvier 1975 à Bruxelles. Elle est mariée à Jean-Philippe Van Parijs. Elle a deux enfants, un garçon et une fille.

Ministre de la Région wallonne

Le 21 octobre 2010, Wilmès est nommée ministre de la Région wallonne dans le gouvernement Leterme. Elle est la première femme à occuper ce poste. Elle reste en fonction jusqu'au 22 octobre 2011.

Première ministre de la Région wallonne

Le 17 octobre 2019, Wilmès est nommée première ministre de la Région wallonne. Elle devient la première femme à occuper ce poste. Elle reste en fonction jusqu'au 22 octobre 2020.

Résultats électoraux

Association	Candidate	Date	Liste	Place sur la liste	Suffrages	Résultat	Pourcentage au sein de la circonscription
Senatsélections	MR-Vereniging	2005	CD-20	2e plaats	802	2e	23,54%
Provincialeverkiezingen	MR-Vereniging	1 oktober 2009	LF	20e plaats	1.077	26	14,41%
Senatsélections	MR-Vereniging	2010	CD-20	2e plaats	1.339	26	40,53%
Parlementaireverkiezingen	MR-Vereniging	13 oktober 2010	LF	1e plaats	3.000	1e	30,4%
Parlementaireverkiezingen	MR-Vereniging	20 september 2019	MR	2e plaats	15.100	2e	17,47%

Personlijk

Wilmès is getrouwd met Jean-Philippe Van Parijs. Ze heeft twee kinderen, een zoon en een dochter.

Worpleiding

- 2015-2019: Minister van Begroting
- 2010-2011: Minister van Financiën
- 2005-2009: Minister van Financiën
- 2001-2005: Minister van Financiën
- 1999-2001: Minister van Financiën

Partij

- 2015-2019: MR
- 2010-2011: MR
- 2005-2009: MR
- 2001-2005: MR
- 1999-2001: MR

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Commissies

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Bevindingen

- 2019-2020: Lid van de Senaat
- 2010-2011: Lid van de Senaat
- 2005-2009: Lid van de Senaat
- 2001-2005: Lid van de Senaat
- 1999-2001: Lid van de Senaat

Figure 3b: Side-by-side comparison of the different language versions of the biographical page of Sophie Wilmès (SW:DEx 2020, SW:ENx 2020, snapshots show the last available revisions for July 2020).



APPENDIX 2

In this appendix we list the various websites from Wikipedia and from Belelite (a scientific commission for the history of Belgium). This paper is based on the web versions retrieved on August 12, 2020.

AVA:DE (2020). Achille Van Acker. Wikipedia. https://de.wikipedia.org/wiki/Achille_Van_Acker

AVA:EN (2020). Achille Van Acker. Wikipedia. https://en.wikipedia.org/wiki/Achille_Van_Acker

AVA:FR (2020). Achille Van Acker. Wikipedia. https://fr.wikipedia.org/wiki/Achille_Van_Acker

AVA:NL (2020). Achiel van Acker. Wikipedia. https://nl.wikipedia.org/wiki/Achiel_Van_Acker

LPM:DE (2020). Liste der Premierminister von Belgien. Wikipedia. https://de.wikipedia.org/wiki/Liste_der_Premierminister_von_Belgien

LPM:EN (2020). List of prime ministers of Belgium. Wikipedia. https://en.wikipedia.org/wiki/List_of_prime_ministers_of_Belgium

LPM:FR (2020). Liste des Premiers ministres de la Belgique. Wikipedia. https://fr.wikipedia.org/wiki/Liste_des_Premiers_ministres_de_la_Belgique

LPM:NL (2020). Lijst van premiers van België. Wikipedia. https://nl.wikipedia.org/wiki/lijst_van_premiers_van_België

LT:DE (2020). Leo Tindemans. Wikipedia. https://de.wikipedia.org/wiki/Leo_Tindemans

LT:EN (2020). Leo Tindemans. Wikipedia. https://en.wikipedia.org/wiki/Leo_Tindemans

LT:FR (2020). Leo Tindemans. Wikipedia. https://fr.wikipedia.org/wiki/Leo_Tindemans

LT:NL (2020). Leo Tindemans. Wikipedia. https://nl.wikipedia.org/wiki/Leo_Tindemans

RHC-Belelite (2020). Nationale/Federale regering. Belelite. <http://www.commissionroyalehistoire.be/belelite/nl/gov/governmentsoverview/fed>

SW:DE (2020). Sophie Wilmès. Wikipedia. https://de.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

SW:DEx (2020). Sophie Wilmès. Wikipedia. https://de.wikipedia.org/w/index.php?title=Sophie_Wilm%C3%A8s&oldid=200704479

SW:EN (2020). Sophie Wilmès. Wikipedia. https://en.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

SW:ENx (2020). Sophie Wilmès. Wikipedia. https://en.wikipedia.org/w/index.php?title=Sophie_Wilm%C3%A8s&oldid=969142571

SW:FR (2020). Sophie Wilmès. Wikipedia. https://fr.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

SW:FRx (2020). Sophie Wilmès. Wikipedia. https://fr.wikipedia.org/w/index.php?title=Sophie_Wilm%C3%A8s&oldid=173426469

SW:NL (2020). Sophie Wilmès. Wikipedia. https://nl.wikipedia.org/wiki/Sophie_Wilm%C3%A8s

SW:NLx (2020). Sophie Wilmès. Wikipedia. https://nl.wikipedia.org/w/index.php?title=Sophie_Wilm%C3%A8s&oldid=56722304