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Turn, turn, turn: A digital history of German historiography, 1950-2019

Working Papers of the Priority Programme 1859 "Experience and Expectation. Historical Foundations of Economic Behaviour", No. 31

Provided in Cooperation with:
German Research Foundation's Priority Programme 1859 "Experience and Expectation. Historical Foundations of Economic Behaviour", Humboldt-Universität Berlin

Suggested Citation: Wehrheim, Lino; Jopp, Tobias Alexander; Spoerer, Mark (2021) : Turn, turn, turn: A digital history of German historiography, 1950-2019, Working Papers of the Priority Programme 1859 "Experience and Expectation. Historical Foundations of Economic Behaviour", No. 31, Humboldt University Berlin, Berlin, https://doi.org/10.18452/22795

This Version is available at:
https://hdl.handle.net/10419/233857

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Working Papers of the Priority Programme 1859
Experience and Expectation.
Historical Foundations of Economic Behaviour
Edited by Alexander Nützenadel und Jochen Streb

No 31 (2021, April)

Wehrheim, Lino / Jopp, Tobias A. / Spoerer, Mark

Turn, Turn, Turn

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Arbeitspapiere des Schwerpunktprogramms 1859 der Deutschen Forschungsgemeinschaft
„Erfahrung und Erwartung. Historische Grundlagen ökonomischen Handelns“ /
Working Papers of the German Research Foundation's Priority Programme 1859
"Experience and Expectation. Historical Foundations of Economic Behaviour"

HUMBOLDT-UNIVERSITÄT ZU BERLIN

Published in co-operation with the documentation and publication service of the Humboldt University, Berlin (https://edoc.hu-berlin.de).

ISSN: 2510-053X

Redaktion: Alexander Nützenadel, Jochen Streb, Ingo Köhler

V.i.S.d.P.: Alexander Nützenadel, Jochen Streb

SPP 1859 "Erfahrung und Erwartung. Historische Grundlagen ökonomischen Handelns"
Sitz der Geschäftsführung:
Humboldt-Universität
Friedrichstr. 191-193, 10117 Berlin
Tel: 0049-30-2093-70615, Fax: 0049-30-2093-70644
Web: https://www.experience-expectation.de
Koordinatoren: Alexander Nützenadel, Jochen Streb
Assistent der Koordinatoren: Ingo Köhler

Recommended citation:

Wehrheim, Lino / Jopp, Tobias A. / Spoerer, Mark (2021): *Turn, Turn, Turn. A Digital History of German Historiography, 1950-2019*. Working Papers of the Priority Programme 1859 "Experience and Expectation. Historical Foundations of Economic Behaviour" No 31 (April), Berlin

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Turn, Turn, Turn

A Digital History of German Historiography, 1950-2019

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April 21, 2021

Abstract

The increasing availability of digital text collections and the corresponding establishment of methods for computer-assisted analysis open up completely new perspectives on historical textual sources. In this paper, we use the possibilities of text mining to investigate the history of German historiography. The aim of the paper is to use topic models, i.e. methods of automated content analysis, to explore publication trends within German historiography since the end of World War II and, thus, to gain data-based insights into the history of the discipline. For this purpose, we evaluate a text corpus consisting of more than 9,000 articles from eleven leading historiographical journals. The following questions are addressed: (1) Which research subjects mattered, and in how far did this change over time? (2) In how far does this change reflect historiographical paradigm shifts, or 'turns'? (3) Do the data allow to map the emergence of these turns, i.e., can we periodize/historicize them? (4) Which of the proclaimed turns mattered in the sense that it is actually reflected in the research themes we find, and which turn does not?

Keywords: German historiography, cultural turn, digital history, topic modelling.

JEL-Codes: B40, N01

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1. Introduction

When it comes to digital methods, historians seem to have been more reluctant than scholars from other disciplines to use them, although, slowly but surely, the digital turn is about to catch up with Clio as well.[1] By now, it is a commonplace that emerging digital tools change the way historians study the past. In this article, following examples from the digital humanities,[2] we study the history of German historiography since the 1950s by using computer-assisted automated content analysis. Specifically, we apply the method of topic modelling to study a corpus consisting of about 9,000 articles from eleven leading German-language history journals and covering the publication period from 1950 to 2019. Our aim is twofold. First, we want to provide an overview of general publication trends, that is, changes as well as continuities in research themes and methods. To this end, the topic modelling approach is particularly suitable as it allows processing a large sample of historiographical output by means of an explorative, purely data-driven and agnostic approach. The second aim is to answer the following questions: (1) Which research subjects mattered, and in how far did this change over time? (2) In how far does this change reflect historiographical paradigm shifts, or 'turns'? (3) Do the data allow to map the emergence of these turns, that is, can we periodize/historicize them? (4) Which of the proclaimed turns mattered in the sense that it is actually reflected in the research themes we find, and which turn does not? In this vein, we will empirically test the hypothesis stated by Georg Iggers that many radical culturalist positions are mainly found in theoretical texts rather than in concrete historiographical analyses.[3]

Our paper links with two strands of literature. The first centers around the sources analyzed. There is a growing amount of research which could be summarized as "quantitative journal analysis" and which has been striving on facilitated digital access to whole journal editions, for example, via JSTOR.[4] For manifold reasons, this research is interested in the academic article as the principle unit of observation and as the basis of further information gathering on author

[1] Andreas Fickers and Tim van der Heijden, 'Inside the Trading Zone: Thinkering in a Digital History Lab', *Digital Humanities Quarterly*, 14 (2020), p. n.a.; Roy Rosenzweig Center for History and New Media, *Current Research in Digital History Volume 2* (2019); Bob Nicholson, 'The Digital Turn', *Media History*, 19 (2013), pp. 59–73; C. Annemieke Romein, Max Kemman, Julie M. Birkholz, James Baker, Michel De Gruitjer, Albert Meroño-Peñuela, Thorsten Ries, Ruben Ros, and Stefania Scaglioa, 'State of the Field: Digital History', *History*, 105 (2020), pp. 291–312.

[2] See section 2.

[3] Georg G. Iggers, *Geschichtswissenschaft im 20. Jahrhundert. Ein kritischer Überblick im internationalen Zusammenhang* (Göttingen, 2007), p. 127.

[4] Strictly speaking, such research has been conducted in all possible disciplines, not just in historiography. In fact, somewhat matching with our introductory statement, history certainly has not been at the forefront of that research but rather in the rear of the group of followers.

and related characteristics. Much of the relevant research has actually been conducted by economic historians, presumably because economic historians feel closer to the publication culture in the social sciences with its greater emphasis on the journal article as preferred form of publication and its greater inclination to subject research quality and research success to measurement. Studies include such that investigate the dissemination of quantitative methods in (economic) history in a cross-sectional as well as longitudinal perspective; such that subject (economic) history to a citation and network analysis to rank journals or study research quality and success; and such that investigate, like we do, trends in themes (economic) historians have been turning to in the past.[5]

The second strand covers the almost gargantuan amount of literature on epistemological turns in (German) historiography. As James W. Cook has pointed out already in 2012, especially the scholarly engagement in the cultural turn has become an

> "increasingly viral concept […] Since the early 2000s, it has figured prominently in hundreds of historical monographs, articles, and reviews; two AHA presidential

[5] Bernardo Batiz-Lazo, Rasol Eskandari, and John Goddard, 'Online publishing and citation success in the accounting, business and economic history of Spain, 1997-2011', *Investigaciones de Historia Económica*, 11 (2016), pp. 153–163; Michael Buchner, Tobias A. Jopp, Mark Spoerer, and Lino Wehrheim, 'Zur Konjunktur des Zählens – oder wie man Quantifizierung quantifiziert. Eine empirische Analyse der Anwendung quantitativer Methoden in der deutschen Geschichtswissenschaft', *Historische Zeitschrift*, 310 (2020), pp. 580–621; Michael Buchner, Tobias A. Jopp, Mark Spoerer, and Lino Wehrheim, 'On the Business Cycle of Counting – or How to Quantify Quantification. An Empirical Analysis of the Application of Quantitative Methods in German Historiography', *RESH Discussion Papers No. 7/2020* (2020), pp. 1–48; Martina Cioni, Giovanni Federico, and Michelangelo Vasta, 'The long-term evolution of economic history: evidence from the top five field journals (1927–2017)', *Cliometrica*, 14 (2020), pp. 1–39; Claude Diebolt and Michael Haupert, 'A cliometric counterfactual: what if there had been neither Fogel nor North?', *Cliometrica*, 12 (2018), pp. 407–434; Gianfranco Di Vaio, Daniel Waldenström, and Jacob Weisdorf, 'Citation success: Evidence from economic history journal publications', *Explorations in Economic History*, 49 (2012), pp. 92–104; Gianfranco Di Vaio and Jacob Weisdorf, 'Ranking economic history journals: a citation-based impact-adjusted analysis', *Cliometrica*, 4 (210AD), pp. 1–17; Johan Fourie and Leigh Gardner, 'The internationalization of economic history: a puzzle', *Economic History of Developing Regions*, 29 (2014), pp. 1–14; Gregori Galofré-Vilà, 'The Past's Long Shadow: A Systematic Review and Network Analysis of Economic History', *Research in Economic History*, 36 (2020), pp. 109–124; Eric A. Johnson, 'Counting "How It Really Was": Quantitative History in West Germany', *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 21 (1988), pp. 61–79; Eric A. Johnson, 'Quantitative German History in the United States and the United Kingdom', *Central European History*, 24 (1988), pp. 396–420; J. Morgan Kousser, 'Quantitative Social-Scientific History', in Michael G. Kammen and John Hope Franklin, eds., *The Past Before Us. Contemporary Historical Writing in the United States* (Ithaca/NY, 1980), pp. 433–456; Robert A. Margo, 'The integration of economic history into economics', *Cliometrica*, 12 (2018), pp. 377–406; Dietrich Oberwittler, 'From Coding to Decoding? An Analysis of Historical Social Research in Germany in the 1980s and Early 1990s', *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 30 (1997), pp. 192–196; Dietrich Oberwittler, 'Die Historische Sozialforschung in den achtziger Jahren: Quantitative Analyse eines Forschungsgebietes', *Historical Social Research*, 18 (1993), pp. 76–108; John F. Reynolds, 'Do Historians Count Anymore? The Status of Quantitative Methods in History, 1975–1995', *Historical Methods*, 31 (1998), pp. 121–148; Steven Ruggles and Diana L. Magnuson, 'The History of Quantification in History: The JIH as a Case Study', *The Journal of Interdisciplinary History*, 50 (2019), pp. 363–381; Lino Wehrheim, 'Economic History Goes Digital: Topic Modeling the Journal of Economic History', *Cliometrica*, 13 (2019), pp. 83–125; Robert Whaples, 'The Supply and Demand of Economic History: Recent Trends in the Journal of Economic History', *Journal of Economic History*, 62 (2002), pp. 524–532; Robert Whaples, 'A Quantitative History of the Journal of Economic History and the Cliometric Revolution', *Journal of Economic History*, 51 (1991), pp. 289–301.

addresses; at least three previous AHR Forums; and various fora in the *Hispanic American Historical Review* (1999), the *Journal of American History* (2003), *Cultural and Social History* (2004), and *Social Science History* (2008)."[6]

Therefore, we will waive a thorough literature review and just highlight a few points. Maybe the most comprehensive investigation in recent years was proposed by Doris Bachmann-Medick, who studied the cultural turn for the field of cultural sciences in general, stating that it was not a single turn but a combination of multiple, sometimes successive, sometimes parallel turns.[7] Thomas Mergel examined four of them (the linguistic, anthropological, iconic, and spatial turn) in terms of their influence on political history.[8] Christoph Conrad studied the cultural turn from a social history perspective, providing a basic quantitative analysis by means of a keyword search.[9] In a special issue of the *Vierteljahrshefte für Zeitgeschichte*, Frank Bajohr, Neil Gregor, Johann Chapoutot, and Stefan Hördler discussed how the cultural turn has influenced historiographical research on National Socialism.[10] At an early point in the debate on the cultural turn, that is in 1997, Peter Schöttler discussed the effects of the linguistic turn on historiography, which he reexamined recently.[11] Finally, Georg Iggers' comprehensive account of German historiography is an invaluable help for interpreting our results of the topic modelling.[12]

Now, if an excessive "turn talk"[13] has been going on for some time, what can we add to the discussion? First of all, we provide a comprehensive digital history of German historiography, supplementing the traditional research on this topic with an evidence-based perspective, which to our best knowledge is a novelty. The specific advantage of topic modelling is that we do not have to limit the quantitative analysis to screening titles or abstracts or to deriving simple keyword frequencies. Instead, we can consider the full text of articles allowing us to take a

[6] James W. Cook, 'The Kids Are All Right: On the "Turning" of Cultual History', *The American Historical Review*, 117 (2012), p. 746. Cook's piece was also part of an AHR Forum on "Historiographic 'Turns' in Critical Perspective", see *The American Historical Review* 2012, Volume 117, Issue 3.
[7] Doris Bachmann-Medick, *Cultural Turns. New Orientations in the Study of Culture* (Berlin, Boston, 2016); Doris Bachmann-Medick, *Cultural Turns. Neuorientierungen in den Kulturwissenschaften* (Hamburg, 2010).
[8] Thomas Mergel, 'Cultural Turns and Political History', *Ricerche di storia politica* (2017), pp. 33–42.
[9] Christoph Conrad, 'Die Dynamik der Wenden. Von der neuen Sozialgeschichte zum cultural turn', *Geschichte und Gesellschaft*, 22 (2006), pp. 133–160.
[10] See Contemporary History Podium "Cultural Turn und NS-Geschichte", *Vierteljahrshefte für Zeitgeschichte* 2017, issue 65, number 2.
[11] Peter Schöttler, *Geschichtswissenschaft vor und nach dem 'linguistic turn'* (Münster, 2018); Peter Schöttler, 'Wer hat Angst vor dem "linguistic turn"?', *Geschichte und Gesellschaft*, 23 (1997), pp. 143–151. For another "contemporary" perspective, see Ute Daniel, 'Geschichte schreiben nach der "kulturalistischen Wende"', *Archiv für Sozialgeschichte*, 43 (2003), pp. 576–599.
[12] Iggers, *Geschichtswissenschaft im 20. Jahrhundert. Ein kritischer Überblick im internationalen Zusammenhang*; Georg G. Iggers, *Historiography in the twentieth century. From scientific objectivity to the postmodern challenge* (Middletown, Connecticut, 2005). In the English version, Iggers takes a more international perspective.
[13] Doris Bachmann-Medick, *Cultural Turns. New Orientations in the Study of Culture* (Berlin, Boston, 2016); Cook, 'The Kids Are All Right: On the "Turning" of Cultual History'; Judith Surkins, 'When Was the Linguistic Turn? A Genealogy', *The American Historical Review*, 117 (2012), pp. 700–722.

comprehensive analysis and to switch between the micro perspective of individual articles to the macro perspective of various journals. Secondly, contrary to other studies on historiographical turns, our approach is rather bottom-up than top-down.[14] Most studies discuss one turn after the other and then ask whether and how they influenced the field. In other words, the (exogenous) turn is the starting point of the investigation. If a quantitative approach is applied, which has been rarely the case to date, certain keywords are used to track turns.[15] In contrast, we do not take turns as given, we rather use the explorative features of topic modelling to uncover text-immanent changes, some of which might be interpreted as reflecting turns, and continuities. Here, our approach draws on the characteristic feature of topic models to be unsupervised or agnostic. In other words, the underlying algorithm works without any prior knowledge, which allows an unbiased assessment of publication trends. Only in a second step, we verify whether there is evidence for commonly debated turns beyond the reach of the topic model by explicitly searching for traces of the various turns. The aim is not to proof or discard the existence of these turns, but rather to ask whether and to what extent they can be observed in the journals under investigation and to date the turns' specific historical development.

The remainder of this paper is structured as follows: In the second section, we present our corpus and shortly elaborate on some technical aspects of topic modelling. In the third section, we take the macro perspective by describing general publication trends. Some of these we analyze in more detail in the fourth section. In the fifth section, we use the results from the topic model in combination with simple keyword frequencies to study the impact of the various turns. In the last section, we briefly discuss our results.

2. Corpus and Methods

In the following, we focus on journal articles that have been published both in German and in leading German journals. We believe this is an acceptable limitation as even (and increasingly) in historiography scholars try to communicate new results and ideas in journals that are read by (influential) members of the profession. One has to keep in mind, however, that in established subfields like economic history or new subfields like global and (post-) colonial history an increasing number of articles has been published in English and/or in non-German-language journals. This is a caveat we have to keep in mind when discussing our results, especially since c. the year 2005.

[14] Nicholson, 'The Digital Turn'.
[15] Conrad, 'Die Dynamik der Wenden. Von der neuen Sozialgeschichte zum cultural turn'.

The corpus is a modestly revised and extended version of the one we applied in a recent study on the stance of quantification in German historiography over 1951-2016.[16] The reasoning governing journal choice outlined there in detail applies here, too.[17] Suffice it to say that we do not claim to provide a corpus which is representative for German historiography in a statistical sense of a (random) sample. If this was the aim, one should also consider some of the many smaller journals that focus on special research topics, such as regional history, to name just one example. Our aim was different. We wanted to concentrate on those journals which, by common opinion, can be regarded as the leading historiographical outlets in (Western) Germany.[18] Naturally, this leadership role has been subject to change, both due to journal-specific and more general reasons, such as globalization and digitization. We argue, however, that for the largest part of the period since 1950, journals such as *Historische Zeitschrift* and *Geschichte und Gesellschaft* have been indeed the places where the "big" historiographical debates are held. Moreover, we wanted to consider a wide array of historical periods and methodical approaches.[19]

Table 1 provides an overview of our corpus of German-language history journals. Given on the far left are the journals' names, with the abbreviations hitherto used in parentheses, and the first year of observation.[20] For each journal, the table reports (i) the number of processed articles which exclude literature or, respectively, research surveys, reviews, obituaries, and editorials;[21]

[16] We dropped the *Jahrbuch für Regionalgeschichte* and added *Saeculum* and *Historisches Jahrbuch* instead.
[17] See Buchner, Jopp, Spoerer, and Wehrheim, 'Zur Konjunktur des Zählens – oder wie man Quantifizierung quantifiziert. Eine empirische Analyse der Anwendung quantitativer Methoden in der deutschen Geschichtswissenschaft'; Buchner, Jopp, Spoerer, and Wehrheim, 'On the Business Cycle of Counting – or How to Quantify Quantification. An Empirical Analysis of the Application of Quantitative Methods in German Historiography'.
[18] This is also the reason why we include full journals instead of drawing random articles.
[19] The question of journal leadership inevitably leads to the aspect of quantifying journal impact, which we do not want to dwell on at this point. Our choice of the academic article as the source, however, also warrants justification: One could certainly argue that using articles does not suggest itself naturally for this kind of analysis because monographs are still the publication form of choice for the (German) historian. Our corpus reflects the work – and the words, in particular – of over 5,000 authors and, thus, entails a good deal of variation on the author-level. After all, a trend might be initiated by few, but it needs many to follow to be sustained. To implement the same degree of variation based on monographs, we would have to make tremendous efforts, which are hardly manageable as long as the digital access to whole book collections is not as convenient as for articles. Consider that our corpus has around 240,000 (non-standardized) pages. Assuming that the average historical monograph has 300 pages, which is a low guesstimate in our view, we would have to hand- and computer-process more than five times the page count we actually have in order to arrive at 4,000 monographs which were each authored by a different author. Besides the high resource demand, there is the problem of how to select monographs. By the standing of the author? By series? To be clear, this selection is also present in our corpus. But we, so to say, outsourced it to the journals' editors, who decided on acceptance and rejection over the years. While we are aware of that problem, we plan on discussing this aspect of our data in a separate paper, though, since we want to lay the descriptive fundament first.
[20] The *HZ* (1859), the *AfK* (1872), the *HJ* (1880), and the *VSWG* (1903) were founded before 1950. The *JWG* was founded in the German Democratic Republic in 1960, and we dropped the years before 1991 because we do not want to engage in a system- or, respectively, ideological comparison here. As for the remaining journals, the first year of observation is equal the journal's year of founding.
[21] We also excluded articles from a special issue if it was dedicated to publishing conference papers or if it was published on the occasion of a journal anniversary. Note that the issues of journals like the *AfS* and the *JWG* have been theme-specific by design, supplemented in the case of the *JWG* by an open section.

(ii) its share in the sum total of processed articles; (iii) the number of token that the article represent (roughly equal to the number of words); and (iv) two pieces of information on authorship, to which we will come back in a few lines, namely the share of female authors in all authors (both for mixed male-female and exclusive female authorship) and the share of single-authored articles. On the whole, we gathered slightly over 9,000 articles from eleven journals, yielding about 94 million tokens after processing (see the description below) as the basis for the analysis.

Tab. 1 Corpus Description

Journal	covered since	# Articles	Share	# Token	Female authors[a]	Share s.a.p.[b]
			in %		in %	in %
Archiv für Kulturgeschichte (AfK)	1951	1,065	11.7	9,845,193	12.3/11.5	97.9
Archiv für Sozialgeschichte (AfS)	1961	670	7.4	10,287,724	22.7/20.3	93.7
Geschichte und Gesellschaft (GG)	1975	936	10.3	8,693,514	20.4/18.5	92.5
Historisches Jahrbuch (HJ)	1951	760	8.4	7,656,224	7.8 /7.2	98.0
Historische Zeitschrift (HZ)	1950	1,226	13.5	13,583,803	7.1/6.8	98.5
Jahrbuch für Wirtschaftsgeschichte (JWG)[c]	1991	378	4.2	3,438,883	19.0/14.6	87.0
Saeculum (Saec)	1950	1,136	12.5	10,940,251	12.0/11.1	97.7
Vierteljahrshefte für Zeitgeschichte (VfZ)	1953	1,077	11.9	12,614,353	8.5/7.4	95.5
Vierteljahrsschrift für Sozial- und Wirtschaftsgeschichte (VSWG)	1951	726	8.0	6,756,526	9.0/7.7	95.5
Zeitschrift für Historische Forschung (ZHF)	1974	515	5.7	5,866,750	16.1/15.0	97.3
Zeitschrift für Unternehmensgeschichte (ZUG)	1956	580	6.4	4,526,209	11.4/9.8	95.3
Total		9,069	100.0	94,209,430	12.5/11.3	96.0

Notes: [a] Share of articles by at least one female author/exclusively female authors. [b] s.a.p. = single authored papers. [c] All articles of 2019 published in English. Sources: authors' own calculations.

Studying the themes of over 9,000 research articles by means of traditional textual analysis (i.e., close reading of each and every article) would exceed our time resources. However, the field of computational linguistics offers an array of different methods which can be applied for the purposes of this article. There have been various papers from a number of disciplines with similar research goals as ours, that is, studying publication trends within academic journals, most of them relying on a specific approach called topic modelling.[22] This term describes a class of

[22] A non-exhaustive list of articles applying topic models on research papers contains the following: Angela Ambrosino, Mario Cedrini, John B Davis, Stefano Fiori, Marco Guerzoni, and Massimiliano Nuccio, 'What topic modeling could reveal about the evolution of economics', *Journal of Economic Methodology*, 25 (2018), pp. 329–

different statistical algorithms for automated content analysis, the most common version of which, *Latent Dirichlet Allocation* (LDA), was introduced in 2003.[23] Since then, various modifications have been developed which employ other statistical assumptions on which LDA is based. However, due to its straightforward structure and implementation, classic LDA is still the dominant model. Because LDA was developed almost two decades ago, there are ample introductions to its principles, which is why we forego a detailed discussion and only point out the most important aspects.[24] Basically, LDA builds on the assumption that words that tend to co-occur also share a common meaning and, thus, build what is called the topic of a text. For example, the words *"Kaiser", "Bismarck", "Otto", "Reichstag", "Wilhelm"* all suggest that their common denominator is the "German *Kaiserreich*".[25] LDA looks for such groups of words within a collection of texts and then calculates the share of those groups for every document. Thus, the output is twofold: First, there are topics, that is, groups of words that, according to the logic of the algorithm, seem to share a common theme; and second, there are topic distributions of all documents. The common theme may be what we typically understand as a topic, such as "German *Kaiserreich*" or "religion", but it could also be merely a linguistic pattern, which may or may not provide useful information. As is shown below, many topics consist of linguistic patterns reflecting a specific research method, such as the use of quantitative tools.

The major advantage of topic modelling is that the whole process is unsupervised; apart from the decision concerning the number of topics *k* to be generated by model and some other

348; André Bittermann and Andreas Fischer, 'How to Identify Hot Topics in Psychology Using Topic Modeling', *Zeitschrift für Psychologie*, 226 (2018), pp. 3–13; Thomas L. Griffiths and Mark Steyvers, 'Finding scientific topics', *Proceedings of the National Academy of Sciences of the United States of America* (2004), pp. 5228–5235; David Hall, Daniel Jurafsky, and Christopher D. Manning, 'Studying the history of ideas using topic models', *Proceedings of the Conference on Empirical Methods in Natural Language Processing* (2008), pp. 363–371; Jochen Lüdering and Peter Winker, 'Forward or Backward Looking? The Economic Discourse and the Observed Reality', *Journal of Economics and Statistics*, 236 (2016), pp. 483–515; Jan Luhmann and Manuel Burghardt, 'Digital Humanities – A Discipline in its Own Right? An Analysis of the Role and Position of DH in the Academic Landscape', *forthcoming in: JASIST Special Issue on "Digital Humanities (DH)"* (2021), p. n.a.; David Mimno, 'Computational Historiography: Data Mining in a Century of Classics Journals', *ACM Journal on Computing and Cultural Heritage*, 5 (2012), pp. 1–19; Allen Beye Riddell, 'How to Read 22,198 Journal Articles: Studying the History of German Studies with Topic Models', in Matt Erlin and Lynne Tatlock, eds., *Distant readings* (Suffolk, 2014), pp. 91–113; Lino Wehrheim, 'Economic History Goes Digital: Topic Modeling the Journal of Economic History', *Cliometrica*, 13 (2019), pp. 83–125.There is also a not yet published project by Melanie Althage, who in her master's thesis used topic models to study trends on "H-Soz-Kult", a German online platform for historians. See https://dhistory.hypotheses.org/162 (access on 11 March 2021).

[23] David Blei, Andrew Y. Ng, and Michael I. Jordan, 'Latent Dirichlet Allocation', *Journal of Machine Learning Research*, 3 (2003), pp. 993–1022; Griffiths and Steyvers, 'Finding scientific topics'.

[24] For introductions, see e.g. David M. Blei, 'Probabilistic Topic Models', *Communications of the ACM*, 55 (2012), pp. 77–84; David M. Blei, 'Topic Modeling and Digital Humanities', *Journal of Digital Humanities*, 2 (2012), pp. 8–11; Megan R. Brett, 'Topic Modeling: A Basic Introduction', *Journal of Digital Humanities*, 2 (2012), pp. 12–16; John W. Mohr and Petko Bogdanov, 'Introduction - Topic models: What They Are and Why They Matter', *Poetics*, 41 (2013), pp. 545–569; Wehrheim, 'Economic History Goes Digital: Topic Modeling the Journal of Economic History'.

[25] These words are actually part of topic 54, see below.

technical aspects,[26] no intervention by the researcher is needed. However, the choice of *k* is crucial as the number of topics fundamentally determines the model structure. Although there are several indicators for identifying the optimal number of topics in a technical sense,[27] this number in most cases is determined by trial and error. The actual topic modelling workflow consists of three steps. In the first step, the documents to be analyzed must be pre-processed; this includes several operations, but most importantly the removal of common words, so-called stop-words like "the", "and" etc.[28] In the second step, the actual model is applied, which can be implemented in different program environments. The third step consists of the analysis of the model output, especially the interpretation of the topics. In most cases, topic data, which is provided by the algorithm on the document-level, will be aggregated to higher levels of interest, for example by creating time series or sub-corpora, which allows to switch between different text levels, that is, to "zoom in and out". Furthermore, the topic data can be used to generate various descriptive statistics, especially measures for comparing the topic distributions of different documents.

For our purposes, we decided to use the basic LDA model, building on our positive experiences in a comparable research design.[29] In the pre-processing step (step I), we had to create a rather long stop-word list to account for historians' rather 'flowery' language and the fact that the corpus consists of articles from a wide range of topics with varying vocabularies. We decided to forgo further preprocessing steps such as stemming or lemmatization.[30] In step II, we first

[26] For a discussion on the variables that determine the results of topic modelling, see, e.g., Daniel Maier, A. Waldherr, P. Miltner, G. Wiedemann, A. Niekler, A. Keinert, B. Pfetsch, G. Heyer, U. Reber, T. Häussler, H. Schmid-Petri, and S. Adam, 'Applying LDA Topic Modeling in Communication Research: Toward a Valid and Reliable Methodology', *Communication Methods and Measures*, 12 (2018), pp. 93–118.

[27] See Rajkumar Arun, V. Suresh, C. E. Veni Madhavan, and M. N. Narasimha Murthy, 'On Finding the Natural Number of Topics with Latent Dirichlet Allocation: Some Observations', in Mohammed J Zaki, Jeffrey Xu Yu, B Ravindran, and Vikram Pudi, eds., *Advances in Knowledge Discovery and Data Mining* (Berlin, Heidelberg, 2010), pp. 391–402; Juan Cao, Tian Xia, Jintao Li, Yongdong Zhang, and Sheng Tang, 'A density-based method for adaptive LDA model selection', *Neurocomputing*, 72 (2009), pp. 1775–1781; Romain Deveaud, Eric Sanjuan, and Patrice Bellot, 'Accurate and effective latent concept modeling for ad hoc information retrieval', *Revue des Sciences et Technologies de l'Information*, 17 (2014), pp. 61–84; Griffiths and Steyvers, 'Finding scientific topics'.

[28] For detailed account on this step, see Jordan Boyd-Graber, David Mimno, and David J. Newman, 'Care and Feeding of Topic Models', in Edoardo M. Airoldi, David M. Blei, Elena A. Erosheva, and Stephen E. Fienberg, eds., *Handbook of Mixed Membership Models and Their Applications* (Boca Raton, 2015), pp. 225–274.

[29] Wehrheim, 'Economic History Goes Digital: Topic Modeling the Journal of Economic History'.

[30] We deem stemming a too simple approach, because it might lead to the situation that words from rather different contexts might be collapsed into a common stem, as, for example, in *Organisation* and Organspende (organ donation), which might, depending on the stemmer, be both be reduced into *Organ*. See Maier, Waldherr, Miltner, Wiedemann, Niekler, Keinert, Pfetsch, Heyer, Reber, Häussler, Schmid-Petri, and Adam, 'Applying LDA Topic Modeling in Communication Research'. This problem is circumvented with lemmatization, that is, reduction to a word's basic form. This step, however, implies a fundamental interference in the structure of the underlying sources, which are being transformed tremendously already by stop word removal. Furthermore, different word variations, which are being standardized by lemmatization, might, in some cases, be of interest for the researcher. On the other hand, some topics might be dominated by simple variations of the same words, which can be observed for the country-related topics in this paper.

ran several trials in order to determine the optimal number of topics *k.* We then decided to set *k* to 80, as in this case, the model produced a decent compromise between coherent but simplistic topics (low *k*) on the one hand and specific but insignificant topics (high *k*) on the other. For this, we relied on MALLET, using the built-in hyperparameter optimization and 2,000 iterations.[31] In step III, we aggregated the document-level topic data to several higher-level categories, such as individual journals, which provides the basis for our analysis in the rest of this paper. Because a detailed discussion of 80 topics, of which almost all carry clear meaning, would not be feasible in a single paper, we decided to assign the topics to larger categories which we call "main topics". In doing so, we were confronted with several ambiguities, which is why we decided to perform this step without any computational support but rather based on our own judgement.[32] The same applies to the step of interpreting and naming the topics.[33]

3. Macro perspective: Model Overview and Major Trends

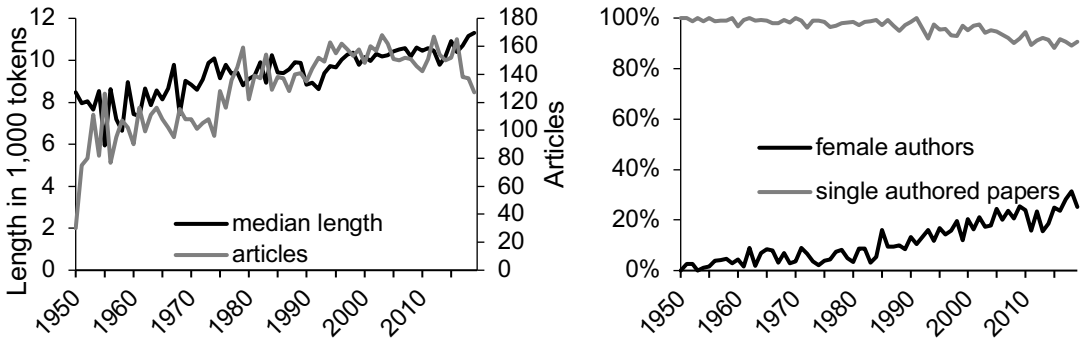
In this section, we will take a macro perspective on the history of German historiography by providing an overview of the results from applying the topic model to our corpus and by illustrating some major developments. Beforehand, some remarks on three key features of our corpus seem necessary. The first one concerns the corpus structure. As a reminder, the corpus consists of 9,069 articles, covering the period between 1950 and 2019. But as the eleven journals have different founding years and due to increasing journal sizes, the articles are not distributed evenly across the 70 years under investigation. Rather, as the left-hand panel (gray line) in Figure 1, shows, there is a division into a period before 1974, for which the corpus contains on average 98.5 articles per year, and the time after 1974 with 146.8 articles, which can be explained mainly by the founding of *Geschichte und Gesellschaft* and the *Zeitschrift für Historische Forschung* in the mid-1970s. But not only has the number of articles increased, articles have also gotten longer (left-hand panel in Figure 1, black line). For example, in the years 1950-1959, the median length amounted to 7,602 words, which increased to 10,600 words in 2010-19, amounting to an increase of almost 40 percent.

[31] Andrew McCallum, *MALLET: A Machine Learning for Language Toolkit* (2002). It was only after the creation of the final model that we learned about the option to specify a specific seed value. For a discussion of model replicability, see Maier, Waldherr, Miltner, Wiedemann, Niekler, Keinert, Pfetsch, Heyer, Reber, Häussler, Schmid-Petri, and Adam, 'Applying LDA Topic Modeling in Communication Research'.

[32] A possible way to use computational support would be to measure the similarity between topics, e.g. based on the cosine similarity.

[33] LDA and other models identify topics based only on word co-occurrence, that is, without any kind of "understanding" of the underlying concepts. This is the reason why topics come without labels, which have to be provided by the researcher.

Fig. 1 Corpus features



Notes: Female authors = share of articles with at least one female author. Sources: authors' own depiction.

The second feature relates to the number of authors per article. As is evident from the right-hand panel (grey line) of Figure 1, almost all articles were, and still are, written by a single author. Until 1990, the share of single-authored papers amounted to 96.5 percent, and there is not a single year in which this number drops below 95 percent. Only from 1990 onwards, there is a slight increase in the share of co-authored papers, although even in 2019, this figure is still below ten percent.

The third feature touches on the sex ratio. Only 12.5 percent of all articles have a female (co)author, and this proportion drops to 11.3 percent when only articles authored exclusively by women are considered (see right-hand panel of Figure 1, black line). Looking at the development of the sex ratio, one can clearly see that German historiography was dominated by male historians until the mid-1980s, at least in terms of journal publications. Since then, there is a gentle increase in the share of female authors, although even in the last decade, the proportion has reached only about 23 percent. This is surprisingly low if one considers that in 2012, the last year for which there is the relevant data available, the share of PhDs and *Habilitationen* accomplished by women in Germany amounted to 44 and 33 percent, respectively.[34]

As has been mentioned before, a crucial task of the topic modeler is the interpretation of the wordlists provided by the model (Figure 2). In order to simplify the narrative of this paper and, even more important, to get a profound understanding of the topics, we decided to equip every topic with a label and to assign the topic, if reasonable, to a higher-level category – i.e., a "main

[34] This gap may provide an explanation for the low number of women in tenured history professorship, which amount to 27 percent. Karen Hagemann, 'Gleichberechtigt? Frauen in der bundesdeutschen Geschichtswissenschaft', *Zeithistorische Forschungen*, 13 (2016), pp. 108–135. As we deem the gender topic as extremely important, we plan to pursue this point in a separate paper.

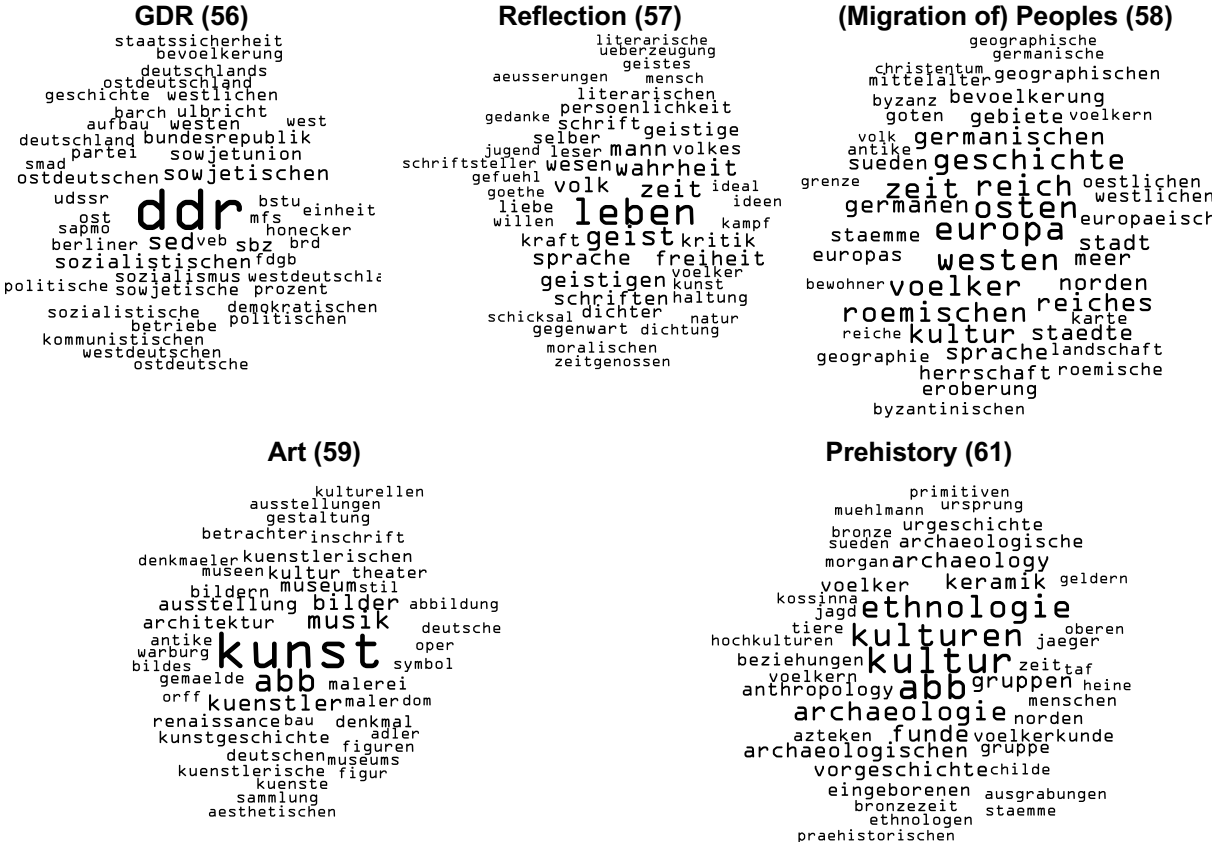
topic". Both steps certainly bear a subjective element.[35] During this process, it became clear that the model produced topics of very different kinds, which our labelling can only partially account for. Some of the topics exhibit a clear-cut, very specific meaning, while others are more ambiguous and general in style. The most indisputable topics are presumably those subsumed under the main topic *Geographic Entities*, such as topics 18 and 22[36] with their obvious reference to France and Russia/USSR, respectively. A special case is the geographic entity of Germany, the topics of which, due to obvious reasons, are more differentiated, which is why we decided to subsume them under a separate main topic. In other cases, a topic's meaning may seem straightforward at first glance, but it may turn out to be rather difficult to find an appropriate label at closer inspection. For example, it could be questioned whether topic 59 is about art or rather about art history. Clearly, all topics are connected to history, ipso facto because the underlying corpus consists only of history journals. In some cases, however, it is not completely beyond question whether the topic mirrors a historical subject, such as art, or rather the historiographic examination of this subject.

Fig. 2 Selected topics (I)[37]

[35] This may be the reason why in some papers on topic modelling, the topics are only referred to by the numbers given to them by the model.

[36] Topic numbers are normally allocated arbitrarily by the model. As we group topics into categories, we realigned their numbers for a better overview, which is why succeeding numbers mostly fall into the same main topic.

[37] An overview on all topics including their shares can be found in the online appendix.



Sources: authors' own depictions.

Another important category of topics consists of those reflecting not a specific subject but rather a general language pattern, which nevertheless bears a certain meaning. A straightforward example is topic 8 (*Quantitative Analysis*, Figure 7 below), which can be interpreted as the semantic footprint of the use of quantitative methods. The meaning of topic 1 is more difficult to access, but if one consults the articles with the highest shares of this topic, a reasonable interpretation may be that it reflects the analysis of structures. In the same vein, topic 5 may be seen as reflecting a more culture-focused approach to history, while topic 3 might indicate a social sciences approach. We argue that these topics, which could be understood as "meta topics", reflect the different approaches to history as well as the reflection on historiography itself, which is why we call the superordinate main topic *Historiography*.[38]

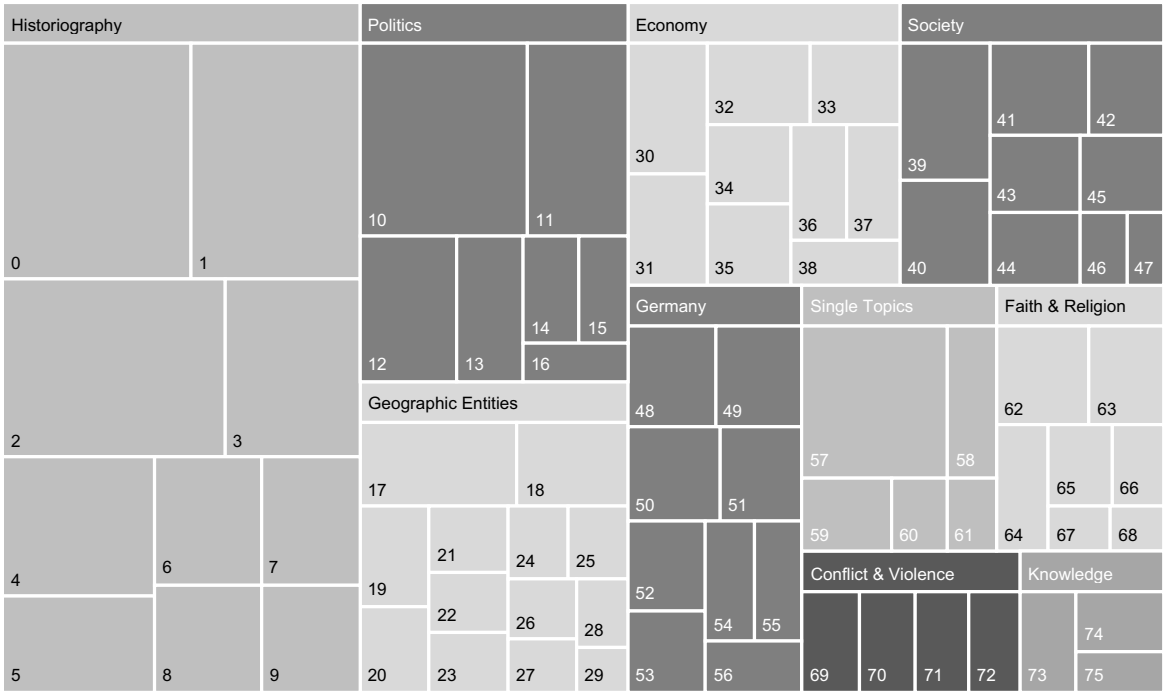
Overall, we identified ten main topics, with one being a residual.[39] A summary of these main topics, their components, and relative weights are depicted as a tree-map in Figure 3.[40] With a share of almost 30 percent, *Historiography* is by far the largest main topic, followed by *Politics*

[38] We will come back to this main topic in the fifth section, where we provide an overview of its components.
[39] We were unable to identify any kind of meaning for topics 76 to 79, which is why we treat them as purely semantic artefacts. Together, they amount to a topic share of 3.6 percent.
[40] For some topics, different categories seem to fit, as for topic 24 *Islamic World*, which could be assigned both to *Geographic Entities* and *Faith & Religion*. As we wanted to avoid multiple allocations, mainly for technical reasons, we chose the category which, in our view, fit best.

with a share of 12 percent. The smallest main topic is *Knowledge* with 2.4 percent, consisting only of three individual topics, all of which have only very low topic shares. By contrast, the main topic with the highest number of components is *Geographic Entities* including 13 topics, each referring to a country or a large region, such as topic 21, which refers to the Iberic Peninsula and Latin America. Regarding the 80 individual topics, one can see that those forming the main topic *Historiography* are, by and large, the ones with the highest individual shares. With 5.7 percent, *Rise & Fall* (topic 0), which covers the passing of time (*Zeit*),[41] is the largest individual topic, followed by *Structures* (topic 1) and *Source Criticism* (topic 2). Both account for 5.1 percent of the corpus, which, compared to an average topic share of 1.3 percent, can be considered as rather large. As these three examples illustrate, most of the large individual topics cover rather general, conceptional historiographical aspects. On the other end of the scale, the small topics are mostly quite specific. For example, the smallest topic with only 0.2 percent covers the Nordic countries (29).

[41] Here, again, the German expression *Werden und Vergehen* can be translated only inadequately.

Fig. 3 Composition of Main Topics



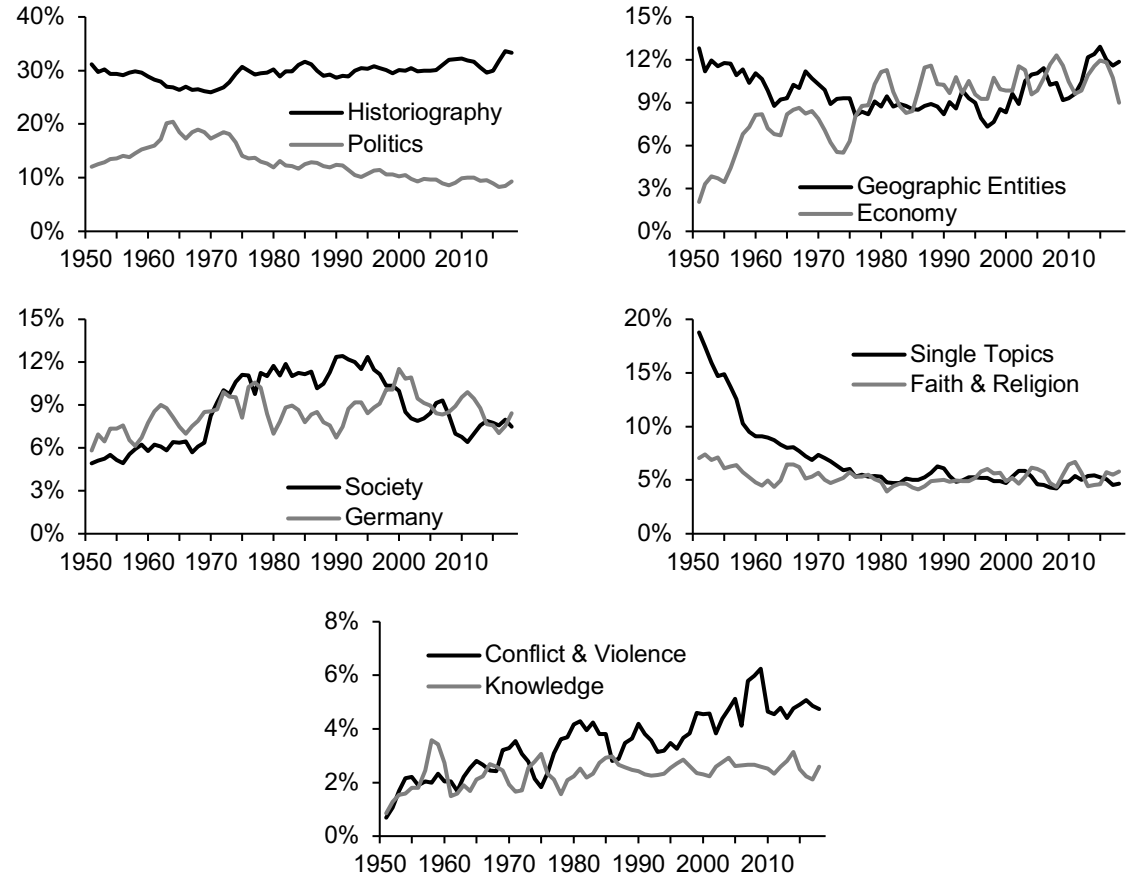
0 Rise & Fall
1 Structures
2 Source Criticism
3 Social History
4 Biographies
5 Cultural History
6 Philosophy
7 Latin Sources
8 Quant. Analysis
9 Theory & History
10 Governmental Action
11 Democracy
12 Foreign Affairs
13 Secular Rule
14 Clerical Rule
15 Socialist Thought
16 Political Ideas
17 United Kingdom
18 France
19 Ancient World
20 Italy
21 Ibero-Americia
22 Russia / USSR
23 Austria / Habsburg Monarchy
24 Islamic World
25 East Asia
26 Ancient Oriental Studies
27 Poland
28 North America
29 Nordic Countries
30 Economic Development & Order
31 (War-) Economies
32 Labor Market
33 Money & Credit
34 Early Modern Trade
35 Business
36 Industry
37 Urban Economy
38 Technology
39 Constitution
40 Social Structure
41 Socialism
42 Agriculture
43 Nobility
44 Family & Sex
45 Municipality & Region
46 Consumption
47 Minorities & Public Order
48 National Socialism
49 HRE Middle Ages
50 *Vormärz*
51 Federal Republic
52 HRE Early Modern
53 Media
54 German Empire
55 Weimar Republic
56 GDR
57 Dichten, Denken, Reflektieren
58 (Migration of) Peoples
59 Art
60 Medicine
61 Prehistory
62 Christianity
63 Rel. Beliefs Middle Ages
64 Catholic Church
65 Papacy
66 Judaism
67 Buddhism & Hinduism
68 Superstition
69 Holocaust
70 Post-War Order
71 World War II
72 Colonialism
73 Science
74 Enlightenment
75 Education

Notes: Box sizes correspond to topic shares. We realigned topic numbers, which are arbitrarily given by the model, in order to provide a better overview. Source: Authors' own depiction.

How did the main topics' share develop over time? On the basis of the time series provided in Figure 4, we can make two essential observations. *Historiography*, *Faith & Religion*, and *Knowledge* basically stay at the same level throughout the whole period. Apparently, those topics are unsusceptible to research trends, at least at the aggregated level. This is different for the remaining main topics. *Economy* and *Conflict & Violence* have more or less constantly increased their relative importance, while *Politics*, after an increase during the 1960s, has become less and less visible. In case of *Society*, we can observe a tremendous increase in the early 1970s, coinciding with the boom of social history, which lasted until the mid-1990s. Since then, this main topic has declined considerably in importance. The residual category *Single Topics*

shows a clear downward trend, resulting mainly from topics 57, 58, and 61[42] which predominantly were addressed in the 1950s and which lose importance afterwards. For *Geographic Entities*, we find a decreasing trend until the mid-1990s, which then turned into an upward trend, basically driven by topic 17, *United Kingdom*. The main topic *Germany* reveals a much more volatile development. Its first peak during the 1970s can mostly be attributed to topic 55 *Weimar Republic*, while the second one around the year 2000 results from an increase of topic 56, *GDR*.

Fig. 4 Main Topics – Development



Notes: Annual topic shares, three-year centered moving averages. Sources: Authors' own depiction.

The eleven journals in our corpus represent quite different sub-fields of historiography, such as economic and cultural history. But are these journals really that different in terms of their topics? To answer this question, we first calculate the topic distribution for every journal as shown in Table 2a. Besides some less surprising observations, such as *Economics* exhibiting major shares for *JWG*, *VSWG*, and *ZUG*, this comparison also offers some intriguing insights. For

[42] Topic 57 *Reflection* touches two partially intertwined aspects: Firstly, it can be found in articles which reflect on the process of historiography, such as in Ludwig Losacker, 'Was heißt und zu welchem Ende studieren wir Firmengeschichte', *Zeitschrift für Unternehmensgeschichte*, 14 (1969), pp. 212–215. Secondly, it concerns the study of the works by thinkers and poets, i.e. *Dichter und Denker*, such as in Werner Schultz, 'Die Bedeutung des Tragischen für das Verstehen der Geschichte bei Hegel und Goethe', *Archiv für Kulturgeschichte*, 38 (1956), pp. 92–115. Topic 58 covers the *Migration of Peoples*, topic 61 can be mostly found in articles on *Prehistory*.

example, *Saeculum* seems to be the journal with the strongest focus on *Geographic Entities*, whereas *VfZ* is the leading journal on *Conflict & Violence*, being also the journal with the strongest emphasis on *Germany*. Concerning political history, the *VfZ* is again leading, closely followed by *HJ, HZ,* and *AfS.* Although its shares do indeed vary between the individual topics, *Historiography* is about the most important main topic for all journals.

Tab. 2 Journals – Main Topic Distributions and Journal Dissimilarity

a

Main Topic	Total	AfK	AfS	GG	HJ	HZ	JWG	Saec	VfZ	VSWG	ZHF	ZUG	Female	Male
Historiography	29,8	34,2	27,6	36,8	27,5	31,7	30,7	33,7	21,8	27,0	30,0	26,8	30,0	29,8
Politics	12,3	9,5	15,1	9,3	16,9	16,0	4,6	6,5	19,4	8,0	12,7	5,9	9,1	12,8
Geographic Entities	9,8	9,2	6,8	9,0	7,4	11,9	6,1	18,6	7,3	9,5	10,6	5,2	10,4	9,7
Economy	9,2	1,5	10,0	8,8	1,6	3,0	36,1	1,9	5,3	27,5	6,0	41,0	9,7	9,1
Society	8,9	4,9	16,5	13,0	6,3	6,9	11,9	4,9	6,0	13,1	12,8	8,1	11,5	8,6
Germany	8,6	7,0	9,7	6,6	12,5	11,1	4,5	2,1	16,0	5,0	7,6	4,5	7,2	8,8
Single Topics	6,3	11,9	4,0	4,1	5,4	7,2	1,8	14,4	3,2	3,1	3,9	3,1	6,0	6,4
Faith & Religion	5,3	8,4	2,1	3,1	14,6	5,1	0,3	9,5	2,3	1,5	7,1	0,6	5,4	5,3
Conflict & Violence	3,7	0,6	3,2	4,7	1,6	2,3	2,1	1,9	14,3	0,9	0,7	1,3	4,0	3,6
Artefact	3,5	7,1	3,4	2,2	2,9	2,8	1,0	5,3	2,6	2,8	5,0	1,8	4,1	3,5
Knowledge	2,4	5,7	1,5	2,4	3,5	2,2	0,8	1,3	1,8	1,5	3,6	1,8	2,8	2,4

b

	AfK	AfS	GG	HJ	HZ	JWG	Saec	VfZ	VSWG	ZHF	ZUG
AfK	0,00										
AfS	0,36	0,00									
GG	0,28	0,09	0,00								
HJ	0,10	0,33	0,29	0,00							
HZ	0,10	0,24	0,16	0,10	0,00						
JWG	0,46	0,21	0,18	0,46	0,35	0,00					
Saec	0,13	0,36	0,26	0,23	0,14	0,45	0,00				
VfZ	0,40	0,17	0,19	0,33	0,24	0,32	0,39	0,00			
VSWG	0,29	0,22	0,19	0,28	0,22	0,12	0,32	0,30	0,00		
ZHF	0,12	0,35	0,26	0,14	0,15	0,41	0,24	0,41	0,24	0,00	
ZUG	0,42	0,23	0,24	0,42	0,34	0,11	0,44	0,30	0,13	0,42	0,00

Notes: a: Main topic shares for different sub-corpora (in percent). b: Jensen-Shannon-Divergence between journals based on individual topics, 1 = perfect dissimilarity, 0 = perfect identity. Sources: authors' own calculations.

A handy feature of topic models is that they can be used to measure the topical difference between two documents or corpora, which allows a quantitative comparison. A common approach is to compute the Jensen-Shannon-Divergence (JSD), which is a measure used for comparing the difference of two distributions, and which, therefore, can be used to quantify the difference between two topic distributions. The JSD can take values between zero and one, with zero indicating complete accordance and one indicating complete divergence between both distributions. We compute the JSD for each pair of journals based on individual topics (Table 2b). Telling by the JSD-values for all pairings, the journals seem to have quite similar topic distributions. Even the pair with the highest divergence, *AfK* (cultural history) and *JWG* (economic history), only exhibits a JSD value of 0.46, that is, a medium dissimilarity.[43] This can be

[43] If we calculate JSD values based on main topics, the numbers drop to even lower levels, as the aggregation to main topics levels much of the differences between journals. For the *AfK*-*JWG*-example, the JSD takes a value of 0.26 if main topics are considered.

explained by the fact that even at the level of individual topics, there is a considerable amount of overlap regarding the topics from *Historiography* as well as some other individual topics such as *Governmental Action* (topic 10) or *Constitution* (topic 39).[44] Regardless of these rather low dissimilarity figures, three clusters of mutual similarity strike out. First, there is the obvious cluster of the three economic history journals *JWG*, *VSWG*, and *ZUG*. The second cluster consists of the more general journals *AfK, HJ, HZ*, *Saeculum,* and *ZHF*. The third cluster is formed by *AfS*, *GG*, and, to a lesser extent, *VfZ*, thus building a cluster on social and contemporary history.

Besides the aspect of topic similarity, the question arises whether the journals differ in terms of their topic diversity. Put differently, one could ask whether there are differences concerning the number of topics covered by the different journals. This question can be answered in two ways. First, we can borrow an index typically used for measuring market concentration, that is, the Herfindahl-Hirschman-Index (HHI).[45] For the overall corpus, the HHI takes a value of 0.02 based on individual topics and 0.15 based on main topics, which means that topic concentration is rather low either way.[46] Similar values result for different journals, with *JWG* and *ZUG* showing higher HHI figures than the rest.[47] This difference, tough, is only marginal, suggesting that all journals exhibit a similar degree of topic variety.

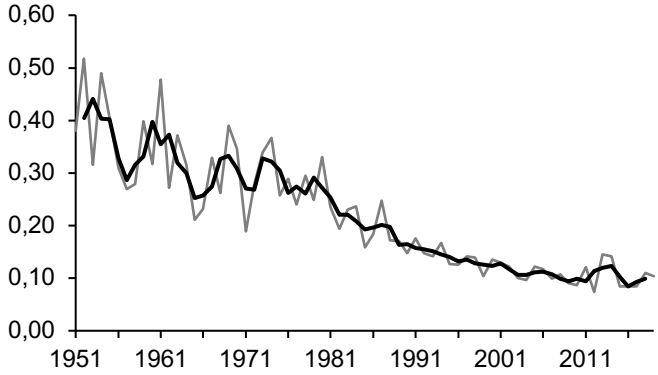
This is confirmed by the second approach, for which we count the number of "big" topics per article. More precisely, we count the number of topics with shares surpassing a threshold of five percent.[48] This way, an article consists on average of 5.7 topics, with journals ranging only from 5.4 (*JWG, VSWG, ZUG*) to 5.9 topics (*GG*, *HZ*). Again, this indicates that journals differ only marginally in terms of topic diversity.[49]

As we have noted before, our corpus is dominated by articles that are (co-) authored by male historians, while female-authored papers account only for 11 to 12 percent of the corpus. How do these articles compare to the majority of male authored papers? This question provides

[44] A topic map showing all topic shares for every journal can be found in the online appendix.
[45] From a technical perspective, the topic share of a document/the corpus is nothing else than a company's market share.
[46] The HHI can take values between one (maximum concentration) and 1/n (equipartition), with n being the number of observations.
[47] HHI values for each journal based on individual/main topics are: *AfK* (0.03/0.17), *AfS* (0.03/0.15), *GG* (0.03/0.19), *HJ* (0.03/0.16), *HZ* (0.03/0.17), *JWG* (0.05/0.25), *Saeculum* (0.03/0.19), *VfZ* (0.04/0.15), *VSWG* (0.03/0.19), *ZHF* (0.03/0.15), *ZUG* (0.04/0.26).
[48] The mean topic share is 1.3 percent.
[49] We will pick up this comparison later in this paper. Generally, the topic data would allow us to dwell on this comparison much further. However, we postpone this feature to future research as we deem this aspect less appealing to readers who are less familiar with German journals.

sufficient aspects to fill a paper of its own, which is why we only briefly outline some observations. Again, the difference between female and male authored articles can be measured by calculating the JSD. Based on individual topics, the overall JSD amounts to only 0.03, that is, there seems to be almost no difference between the sexes. However, if we look at the annual JSD values, we get a somewhat different picture for the long-term development. As can be seen in Figure 5, there has been a quite considerable difference between the sexes until at least the 1980s. If we recall the development of the share of female authors, we can observe a strong negative correlation (-0.86)[50] between both series. While the number of female authors increased, the topical difference became less and less pronounced. If we look back at the topic map in Figure 5, we can see that male authors tend to write more about *Politics*, while female authors show a higher topic share for *Society*. However, we should bear in mind that the absolute number of female-authored papers per year almost constantly stayed below ten until the mid-1980s, which might explain the high JSD-values.

Fig. 5 Topic divergence between female and male authored articles



Notes: Jensen-Shannon-Divergence between articles authored by at least one woman and male-authors based on individual topics. Source: author's own depiction.

4. Micro perspective: topic trends

If we look at the diachronic development of the individual topics, most of them exhibit quite constant topic shares, suggesting that research themes have been, in general, quite stable. However, we can identify a number of topics which show quite pronounced fluctuations, indicating that they are rather trendy topics, which, in turn, might allow conclusions to be drawn on the current research and publication culture (Figure 6). For example, topics 15 and 41 show that socialism and socialist theories were indeed "hot topics" during the 1960s and early 1970s, whereas afterwards, scholars seem to have lost interest. Topics 19 (*Ancient World*) and 26 (*Ancient Oriental Studies*) indicate that questions on ancient history were rather popular in the

[50] We computed zero-order correlation according to Pearson.

1950s. Since then, both topics show declining shares. For the field of economic history, we can observe an increasing interest for economic development and wartime economies (topics 30 and 31), whereas German historians quite dramatically lost interest in *Early Modern Trade* after 1970. Similarly, *Industry* (topic 36) is characterized by a declining share. Increasing shares can be observed for *Business* (topic 35) and *Technology* (38). A special development can be seen for topic 32 *Labor Market*, which displays a tremendous increase during the 1970s, followed by a rough decline at the beginning of the 1990s.[51]

Fig. 6 Selected topics (II)

[51] Here, the question might be whether this interest in the labor market stemmed from a general focus on social history or from the high unemployment in Germany during the late 1970s and 1980s, or a combination of both.

Sources: authors' own depictions.

The field of German history, which consists of nine topics, shows that the various historical periods have been covered quite differently. National Socialism,[52] the early modern period, and the period between the Napoleonic Wars and the revolution of 1848 (*"Vormärz"*), that is, topics 48, 52 and 50, have been studied more or less constantly. Interest in the middle ages and the German Empire (topics 49 and 54) seems to be declining since the 1960s/70s. Inversely, German *Zeitgeschichte* has become more and more popular, as topics 51 *Federal Republic* and 53 *Media* show. The latter is rather exceptional as it is the only topic with a second, more content-related meaning. A very distinctive development can be observed for the period of the Weimar Republic (topic 55, Figure 2 above), which gained importance during the 1970s, only to lose it

[52] There is a second topic on the time of National Socialism, that is, topic 69 *Holocaust*, whose share is increasing quite constantly.

again during the following decades. The reunification of Germany sparked interest at the end of the 1990s and since then has been covered quite constantly. The study of other geographic areas has been rather stable, with the exception of the United Kingdom (topic 17, Figure 2 above), which reveals a constantly increasing share. The UK is also the nation German historians have written about the most, closely followed by France (topic 18, Figure 2 above). For the remaining regions, it is difficult to derive clear statements as the corresponding topic shares are both quite low and volatile. Concerning *Faith & Religion*, the case of Christian topics is ambiguous. On the one hand, there is a decline for *Christianity* and *Papacy* (topics 62 and 65), on the other hand, *Catholic Church* seems to have gained importance as a historical subject since the 1990s. *Judaism* has been a "cold topic" since the 1970s, which coincides with an unfolding interest for eastern religions, especially *Buddhism and Hinduism* (topic 67).[53]

On the micro level, there are several topics which can be found predominantly in certain journals. For example, topic 48 *National Socialism* is mostly covered by *VfZ* with its focus on German *Zeitgeschichte*. This lead of the *VfZ* is even more pronounced for topic 10 *Governmental Action*. Another example is topic 64 *Catholic Church* which is covered mainly by *Historisches Jahrbuch*. The strong emphasis on social history of *Geschichte und Gesellschaft* is expressed by a pronounced share of topic 3 *Social History* (Figure 7 below). For Topic 30, *Economic Development & Order*, the *Jahrbuch für Wirtschaftsgeschichte* is by far the most important journal, showing a considerable lead over the *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte*.[54] The economic history journals are also those exhibiting high shares of topic 8 *Quantitative Analysis* (Figure 7 below), which is not very surprising. However, two points must be noted. Firstly, the *Archiv für Sozialgeschichte* is actually more quantitative than the *Zeitschrift für Unternehmensgeschichte*, although the difference is only marginal. Secondly, the generally rather low shares of this topic indicate that aside from journals such as the *JWG*, *VSWG*, or *AfS*, German historiography altogether has been not too quantitative what confirms our findings presented in a preceding project.[55] We will come back to this point below.

[53] As stated before, we decided to assign topic 24 *Islamic World* to the main topic *Geographic Entities* as it appears to be slightly more about geographic than religious aspects.
[54] To quantify this gap: the topic share of topic 30 amounts to 10.9 percent for the *JWG* and 3.4 percent for *VSWG*.
[55] Buchner, Jopp, Spoerer, and Wehrheim, 'Zur Konjunktur des Zählens – oder wie man Quantifizierung quantifiziert. Eine empirische Analyse der Anwendung quantitativer Methoden in der deutschen Geschichtswissenschaft'.

5. Tracing the Turns

The macro and micro perspectives taken so far have focused on changes and continuities in (selected) topic shares. In this section, we want to trace the commonly debated turns in historiography in our topic modeling evidence. Table 3 summarizes the set of different turns discussed in the literature and considered in the following analysis.[56] Column one states the turn, and columns two and three give a short description of the turn and German keywords commonly associated with it, respectively. To be clear, with this exercise, we do not aim at proving or discarding the existence of the turns under focus; we take the turns' existence as given, in accordance with the literature claiming them. Rather, our goal is to make a statement on the turns' significance and, possibly, timing.[57]

To that end, we follow a simple two-step procedure with which we identify turns by their significance. In a first step, we look for evidence in suitable topics. The matching of turn to topic is based on the occurrence of turn-related keywords in the word list produced by the topic model. Natural starting points are those topics forming the main topic *Historiography*; these ten topics all relate to the way historiography has been performed, and we reckon that certain turns left a footprint in the topic shares' time pattern. For those turns not traceable in the historiographical topics, we look into content-related topics instead. If we do not find topic-related evidence for a specific turn at all, we proceed with the second step for only such turns. This step involves creating time series of the relative frequency of turn-related single keywords as given in Table 3. We, then, may or may not find weaker evidence on the remaining turns in these series' time pattern.

[56] It is certainly debatable how the linguistic turn, the iconic turn, the spatial turn, and so on, are related to the cultural turn. Are they all different manifestations of the latter, making the cultural turn actually appear to be a sequence of specific turns and, thus, a meta category? Or are they of equal rank with the cultural turn? With Bachmann-Medick, we tend to assume the former, but deem it nonetheless appropriate to name it explicitly beside the other turns. Bachmann-Medick, *Cultural Turns. New Orientations in the Study of Culture*.

[57] We follow Bachmann-Medick's definition of a "turn" which is that "[w]e can only speak of a turn if in its next formational stage the new research focus shifts from the object level of new fields of inquiry to the level of analytical categories and concepts – in other words, if the potential turn does not merely identify new objects of study, but becomes a tool and medium of knowledge itself." Bachmann-Medick (2016), p. 16. For an instructive piece on the nature of turns, see Sybille Krämer, 'Windungen und Wendungen geisteswissenschaftlicher Debatten: Ein Kommentar zu den Grenzen des ‚performative turn', ‚media turn' und ‚iconic turn'', in Oliver Jahraus and Mario Grizelj, eds., *Theorietheorie* (München, 2011), pp. 181–195.

Tab. 3 Commonly claimed historiographical turns

Claimed turn	What the turn is about	Associated German keywords
Cultural turn	Meta category entailing all subsequently mentioned turns; describable "[…] in general as the historic trigger of a dynamic process of cultural reflection"[a]	Akteur, Identität, Kultur
Global turn	"A 'global turn' is thus bringing into play the translatability of the categories of the study of culture, beyond the dominance of Western categories."[b]	Global, Globalität
Iconic/Pictorial turn	"This turn has led to a new epistemological awareness of images in the study of culture."[c]	Bild, Bildnis, Symbol, symbolisch, visuell
Linguistic turn	"Building on these insights from structuralist linguistics, proponents of the linguistic turn assume that reality is structured by language and, like language itself, should be understood as a system of signs, representations and differences."[d]	Sprache, Sprachen, sprachlich, linguistisch, Kommunikation, kommunikativ, Diskurs, Narrativ
Microhistorical turn	"History must turn to the conditions of everyday life as they are experienced by common people."[e]	Akteur, Alltag, Mentalität, mental, Identität
Performative turn	"The performative turn has called attention to the expressive dimension of both actions and action-based events, including staged social culture."[f]	Ritual, Performanz, performativ, Symbol, symbolisch, Praxis, praxeologisch
Postcolonial turn	"[…] 'postcolonial' refers to the long-term structuring of global relations by colonialism, decolonization and neocolonialist trends. […] it has initiated a cultural theory that is focused on a critique of hegemonic Eurocentric imperial discourses and […] has trained its sights on Eurocentric knowledge structures and representational systems."[g]	Kolonialismus, (post-) kolonial
Spatial turn	"[It] emerg[ed] from constructivist geography, pointing out the fact that all social action takes place in spaces, shaping and constructing them. For historians, the spatial turn includes the disturbing message that time is not the only dimension they have to take care of."[h]	Raum, Räume, räumlich

Sources: [a] Bachmann-Medick (2016), pp. 1-2, 21; [b] ibid. (2016), p. 291; [c] ibid., p. 245; [d] ibid., p. 22; [e] Iggers (2005), p. 102; [f] Bachmann-Medick (2016), p. 73; [g] ibid., p. 132; [h] Mergel (2017), p. 34.

Differentiating between evidence based on topic and on keyword occurrences needs explaining. What are the epistemological differences between both approaches? Conducting a keyword search requires specifying terms in advance. In fact, it is rather easy to quickly come up with suitable words and, thus, – supposedly hard – evidence to substantiate a turn happening. However, the risk inherent in this kind of approach is twofold. First, one may only find what one is looking for anyway; psychologists call this phenomenon confirmation bias. Second, because keyword frequencies, by definition, focus on isolated terms, context is lost. Possibly, an increase in a keyword's frequency only results from an inflationary use of this term in a completely different context or represents some other kind of linguistic artefact, perhaps stemming from only a few documents. The explanatory power of an isolated term's use over time must therefore not be overstretched. In contrast, running a topic model does not require specifying any categories or filters in advance; conditional on the permitted number of topics, the model

identifies what is significant (see the technical discussion above). Topic models are, what we like to call, agnostic.[58] Consequently, if we were to find a topic representing the aspect *gender*, but no topic representing the examination of, for example, iconic symbols, the first is a more significant category than the latter. A category or an aspect not identified by the model does not imply they were inexistent; it just means that they are insignificant in comparison. Of course, it is also possible that a category is not connected to a characteristic language pattern, therefore leaving no specific linguistic footprint that the algorithm could identify. Generally, sceptics may object that abstract concepts such as turns are too complex for being uncovered by the methods applied here. Naturally, if test results are negative, this might be explained by the instruments being not sufficiently sensitive, therefore producing false negatives. However, in our specific case, we will argue that the results described below do indicate that topic modelling may not be a perfect, but, nevertheless, one of the most adequate instruments available for our purposes. Beyond that, the topic model builds on word co-occurrences, which is why a topic is a much better indicator for underlying categories because it captures not only certain buzzwords but rather the common meaning of numerous words.[59] This does not mean that the results from the keyword search would tell us nothing about the development of the underling articles. Their explanatory power is just lower, which brings us to the conclusion that turns traceable in topics must have been much deeper than those which can only be identified by very specific keyword searches.

Table 4 and Table 5 (below) summarize our results on turn traces in the corpus. Table 4 reports on the first step of our procedure, indicating the topic containing the turn's footprint; the timing with either an open end (turn still ongoing) or an explicit end date (reversal of the original turn); the topic share's scale (percentage over entire observation period); and the proportion of articles exhibiting the respective topic to an amount of, at least, five percent (for this threshold, see our earlier discussion). The latter two indicators help to evaluate a turn's relative significance. Especially the latter indicator seems helpful as it, so to say, measures the diffusion of the turn-related ideas and practices. As for the proposed timing, it is important to keep in mind that the beginning of the turn period does not fall together with the first turn-related publications, which will most certainly date earlier. Rather, a turn beginning in this or that year is indicating that a minimum-necessary scale of dissemination of turn-related ideas and research practices has been realized by then.

[58] Wehrheim, 'Economic History Goes Digital: Topic Modeling the Journal of Economic History'.
[59] Surely, a topic can also result from only a few articles, but then its share will be rather low.

Tab. 4 Tracing the turns (I)

First step: Topic modeling evidence Turn	In topic	Turn period	Topic share	Share of articles including the topic
Gender turn	*Family & Sex (44)*	*1970-1995, 2015-*	*0.9 %*	*4.1 %*
Social turn	*Social History (3)*	*1970-*	*3.0 %*	*20.7 %*
Quantitative turn	*Quantitative Methods (8)*	*1975-1995*	*1.5 %*	*7.7 %*
Post-colonial turn	Colonialism (72)	1995-	0.9 %	3.9 %
Cultural turn	Cultural History (5)	2000-	1.9 %	11.3 %
Linguistic turn[a]	Cultural History (5)	2000-	1.9 %	11.3 %

Notes: [a] This turn is also covered using keywords. Italics mark turns that are not part of Table 3. Authors' own depiction.

Figure 7 shows the shares of the ten historiographical topics (see also Figure 3 above), through which we will go first. Depicted per topic are the word cloud and the evolution of the topic's share in the topic distribution over time. Evidently, topics 2, 6, 7, and 9 either show quite constant or slowly declining shares and, therefore, can be ruled out as containing turn traces;[60] and while topics 0 and 1 show stunning developments which principally demand explanation, we cannot convincingly link one of the turns reported in Table 3 with them either.[61] However, this is different for the remaining topics. Topic 5, which we labeled cultural history, contains words such as *Kultur* (culture), *Akteur* (player), and *Identität* (identity). Clearly leaving its footprint in this topic is the cultural turn in a broad sense, as the meta-category.[62] According to the topic share's upward trend, the cultural turn has been taking place since about the beginning of the new millennium. An even closer look at the corresponding word cloud provides evidence of the linguistic turn, in particular, because we meet terms like *Kommunikation* (communication) and *Diskurs* (discourse). Since these terms are clustered together with *Kultur* (culture), *Akteur* (player), and *Identität* (identity) by the topic modelling algorithm, we can safely say that the linguistic turn indeed is the prime trigger and carrier of the broader cultural turn.[63] The term *Akteur* also points at a shift towards the individual in a microhistorical turn, which will be addressed in step 2.

[60] Here, topic 9 *Theory & History* is particularly interesting as it mirrors the contemplation on history as a subject of research.

[61] As stated above, topic 0 – *Rise & Fall* (*Werden & Vergehen*) – seems to touch on the aspect of the passing of time, suggesting that this topic reflects a chronological, narrative, and often even literary style of historiography, which has notably lost attractiveness over time. In comparison, topic 1 covers the investigation of structures, which has become a dominant approach since the 1970s. Interestingly, this topic shows a constant upward trend until around 2010, which somewhat contradicts the general claim about the cultural turn, namely, that it was associated with a renunciation of structures. Iggers, *Geschichtswissenschaft im 20. Jahrhundert. Ein kritischer Überblick im internationalen Zusammenhang*, p. 64.

[62] The article with the highest share of topic 5 (almost 60 percent) is Menja Holtz, Esther Möller, Eva Spies, and Franziska Torma, 'Begegnungen auf der Spur. Eine neue Perspektive auf Kulturkontakt und Materialität', *Saeculum*, 66 (2016), pp. 177–188. This piece is the introductory article to a special issue on the "materiality of intercultural encounter" ("*Materialität kultureller Begegnungen*").

[63] Here, our evidence supports Bachmann-Medick's (2016), p. 21, assessment.

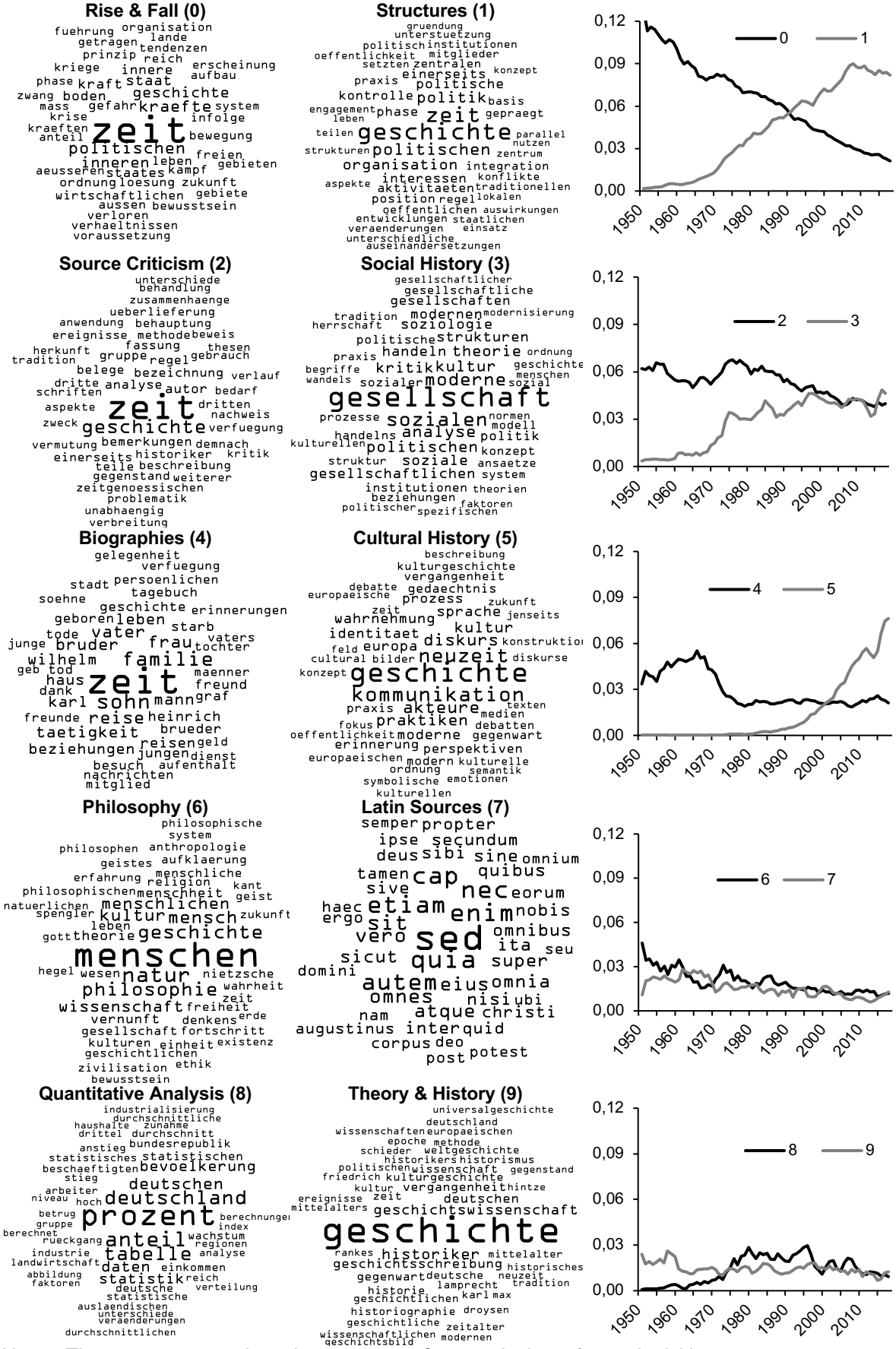
Furthermore, topics 3 and 8 suggest two turns to have happened, which, commonly, are not addressed as such and therefore not reported in Table 3. However, we propose to take them into account, too. The one may be labelled the "social turn" and is reflected in the pattern of topic 3 – *Social History*. Here, the establishment of *Historische Sozialwissenschaft* (historical social science)[64] left its clear imprint on German historiography. It quite matches with the rise of *Historische Sozialwissenschaft* that historians were drawn away from biographical research and the individual by tendency, illustrated by the massive drop of topic 4 – *Biographies* –, and turned towards the collective as the unit of observation, illustrated by the rise in topic 2 – *Structures*. The establishment of *Historische Sozialwissenschaft* was accompanied by a stronger implementation of quantitative methods, as mirrored in topic 8. As we have mentioned before, this topic can mainly be found in the economic history journals as well as the *AfS*, and, to a lesser degree, in *GG*.[65] However, based on the topic modelling evidence we propose an additional "quantitative turn" to show, too. This turn has somewhat reversed itself since the mid-1990s, matching with the emerging cultural turn. Interestingly enough, while the cultural turn may have pushed back the use of quantitative methods, it has not come with a general renunciation of structures, obviously, as usually claimed.[66] Neither has the interest in social history weakened; instead, topic 3 clearly indicates that social history has endured the cultural turn, although, as we will show below, the cultural turn has changed the way this research area has been studied.

[64] As Georg Iggers emphasized, the country-specific labels under which social history was established and performed in different countries have idiosyncratic meanings. Accordingly, the term *Social Sciences History* in the English-speaking countries and the *Historische Sozialwissenschaft* in Germany are difficult to use as direct translations. As we cover the German case, we will use the German term *Historische Sozialwissenschaft* instead of its translation, i.e. *Historical Sociology*, in the following. See Iggers, *Geschichtswissenschaft im 20. Jahrhundert. Ein kritischer Überblick im internationalen Zusammenhang*, p. 69.

[65] Quantitative methods have become tremendously important in certain sub-fields, such as economic and social history, during the 1960s, as the history of cliometrics show. See Michael Haupert, 'History of Cliometrics', in Claude Diebolt and Michael Haupert, eds., *Handbook of Cliometrics* (Berlin and Heidelberg, 2016), pp. 3–21; Claude Diebolt and Michael Haupert, 'A cliometric counterfactual: what if there had been neither Fogel nor North?', *Cliometrica*, 12 (2018), pp. 407–434. Beyond economic history, there seems to be a difference between the German and, for example, the US case, with the latter indeed exhibiting an increase of quantitative methods also in non-economic history journals. For example, Geoffrey Barraclough remarked in 1978: "The outstanding characteristic of recent historiography, from the view of methodology, has therefore been what, without exaggeration, may be called a 'quantitative revolution'. Measurement and quantification, as we have seen, have affected practically every branch of historical research during the last one or two decades." Geoffrey Barraclough, *Main Trends in History* (London, New York, 1991), p. 84. See also Ruggles and Magnuson, 'The History of Quantification in History: The JIH as a Case Study'.

[66] We will elaborate on the aspect of methodology below.

Fig. 7 Main topic *Historiography*



Notes: Three-year centered moving averages. Source: Authours' own depicitions.

Our topic model provides traces for two further turns; the shares of the respective topics are depicted in Figure 8. First, topic 44 *Family & Sex* shows that during the 1980s and 1990s, historians did indeed start to acknowledge the role of women, children, and families. However, the topic share drops in the late 1990 and continues to stay lower, indicating a reversal. But, interestingly, the topic share has been rising since 2015 again, telling of a revival. Overall, there has indeed been a shift towards gender and family issues in the 1980s, which was followed by a transition from a classical, socio-historical to a new, less coherent gender history in the 1990s.[67] Moreover, topic 72 *Colonialism* confirms that there has been a growing awareness for colonial history since around the year 2000, which is coherent with the post-colonial turn.[68] But the rather low topic share suggests that research on colonial issues is still a minority subject.

Fig. 8 Family & Sex, Colonialism

Notes: Three-year centered moving averages. Source: Authours' own depicitions.

There remains the question whether we can find topic evidence for the spatial turn. In this case, the main topic *Geographic Entities* and its components are obvious candidates, as they represent spatial structures. While the share of the main topic *Geographic Entities* slowly decreased into the second half of the 1990s, it began to increase since around the year 2000; see the upper right panel in Figure 4. This increase can be mainly attributed to individual topics 17, *United Kingdom*, and 21, *Ibero-America.* However, these topics all represent a certain, rather high-level type of spatial entity, that is, nation-state-like structures, whereas this turn might include also other, more low-level or abstract dimensions of space, such as public or social space. We consider the topic evidence in this case to be rather weak, which is why we will come back to the spatial turn in the following step.

[67] See also Iggers, *Geschichtswissenschaft im 20. Jahrhundert. Ein kritischer Überblick im internationalen Zusammenhang*, pp. 127–131. Bachmann-Medick does not consider gender as a turn: "Although possessing all the features of a turn (a shift from a thematic field to an analytical category, cross-disciplinary application, etc.), gender is at the same time much, much more." Bachmann-Medick, *Cultural Turns. New Orientations in the Study of Culture*, p. 29.

[68] See also Bachmann-Medick, *Cultural Turns. Neuorientierungen in den Kulturwissenschaften*, pp. 131–173.

The evidence presented so far does indeed provide hints on changes which could be summarized as a rather general cultural and a more specific linguistic turn as well as a growing importance of gender and colonial history, a decreasing importance of quantitative history, and a constant importance of social history. But what about the other turns commonly addressed? We cannot find any traces in the topic model for the further four turns mentioned in Table 3 (iconic, global, microhistorical, and performative turns), plus the linguistic and spatial turn (see above). Thus, we proceed with the second step for those turns and use some keyword frequencies to check whether we can find evidence at the level of individual keywords. The results are presented in Table 5 where we list the turns' keywords (instead of topics), their absolute occurrence as well as the share of articles containing these keywords with a relative term frequency of, at least, one per one thousand terms. In Figure 9 (below), we plot time series that help to identify the turns studied in step 2.

First, we searched for expressions connected to the description of visual elements such as *Bild*, *Bildnis*, and *Symbol*, which could serve as indicators for an iconic/pictorial/visual turn. Indeed, the search terms' frequency steadily increases since the 1970s, reaching a peak shortly around the year 2010. Regarding the performative turn, this turn is more difficult to track as it seems to be even vaguer than the other turns. However, if we take the word stem *performa* as an indicator, we can observe a rapid increase around the year 2005, although the overall number of occurrences (1,120) is quite low, as compared to, for example, the word stem *diskurs* (10,243). Other suitable keywords with higher occurrences – and higher ambiguity – such as *symbol* or *ritual*[69] – show a similar development, although in these cases, there is a rather pronounced decline after the peak around 2005. A similar development can be observed for the term *Praxis* (practice), which is the main driver behind the high article share of this turn.[70]

[69] Thomas Mergel, 'Cultural Turns and Political History', *Ricerche di storia politica* (2017), p. 34.
[70] In this case, the ambiguous meaning and the sometimes arbitrary use of the term must be taken into account. Especially, this term could also be attributed to the microhistorical turn.

Tab. 5 Tracing the turns (II)

Second step: Word frequency evidence

Turn	Keyword (s)	Turn period	Term Frequency	Share of articles including keyword(s)
Micro History turn	Akteur, Alltag, Mentalität, mental, Identität	1970/1975-	32,030	8.9 %
Linguistic turn	Sprache, sprachlich, linguistisch, linguistic, Narrativ, Diskurs	1985-	48,156	12.9 %
Iconic/Pictorial turn	Bild, Bildnis, Symbol	1995-	33,273	6.4 %
Spatial turn	Raum, räumlich, spatial	1998-	21,972	4.0 %
Performative turn	Performa*, Symbol, Ritual, Praxis, Praxeologie, praxeologisch	2000-	40,179	10.2 %
Global turn	Global	2005-	9,789	2.7 %

Notes: Authors' own depiction.

Regarding the linguistic turn, Bachmann-Medick has also described how, in the case of historiography, this shift has developed into a narrative turn: "Historical facts are always preconstructed by historians […] and the feelings and motives of historical actors must therefore be construed not as authentic articulations of individuals but as the result of linguistically mediated codes of emotion and action."[71] One can indeed get the impression that recently much research is promoted using the label "narrative". Judging by the frequency of this and other terms such as *Sprache* (language) or *linguistisch* (linguistic), this impression is more than confirmed. Telling by the spread of these keywords (column 4), the linguistic turn is – in quantitative terms – the most significant turn among those summarized in Table 5. The microhistorical turn, which we mentioned already above, is mirrored in an increase of the terms *Akteur* (actor), *Alltag* (everyday life), *Identität* (identity) and *Mentalität* (mentality). The terms *Raum* and *räumlich* (space, spatial) indicate that in the late 1990s, historians have indeed started to focus on the dimension of space, which was also connected to a steep increase in the use of the term *global.* Finally, there remains the question when all the turn talk has begun, which we can approximate by searching for the term "turn".[72] Besides the fact that in this specific case the limitations of a simple keyword search become particularly obvious,[73] the results confirm the finding by James

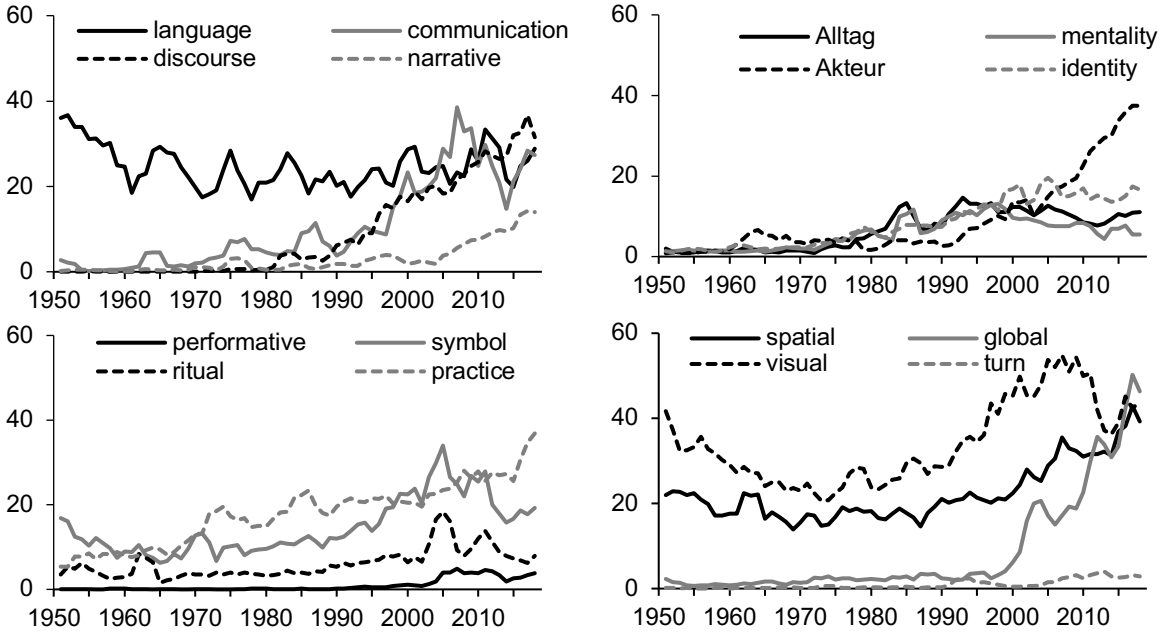
[71] Bachmann-Medick, *Cultural Turns. New Orientations in the Study of Culture*, p. 22.

[72] We remind readers that our corpus does not include discussion articles or the like, where such theoretical aspects are normally to be found. Therefore, the result of 1,155 occurrences must be taken as a conservative estimation.

[73] With 31 occurrences, the article "*Turnen und Sport im sozialen Wandel: Körperkultur in Frankfurt am Main während des Kaiserreichs und der Weimarer Republik*" by Martin L. Müller is among the articles with the highest number of occurrences. However, this article has absolutely nothing to do with any turn whatsoever, but rather analyses sports in Frankfurt during the German Kaiserreich and the Weimar Republic, containing 31 compositions of the word *turn*, as in *Turn- und Sportverein*, resulting from the German word *turnen* (doing gymnastics). This case brilliantly illustrates the risk of falling into false positives. See Martin L. Müller, 'Turnen und Sport im sozialen Wandel: Körperkultur in Frankfurt am Main während des Kaiserreichs und der Weimarer Republik', *Archiv für Sozialgeschichte*, 33 (1993), pp. 107–136.

W. Cook, who observed that talking about turns is a rather recent phenomenon, starting around the year 2005.[74]

Fig. 9 Turn-related keywords[75]



Notes: Word frequencies per 100,000 tokens, three-year centered moving averages. For actual search terms, see footnote 75. Source: authors' own depictions.

In all this, we treated the corpus as a single unit of observation, not differentiating between historiographical fields or individual journals. Although the journals might be rather similar in terms of topics addressed, there are considerable differences concerning the way these topics are covered, not only in diachronic but also in journal comparison. One way to illustrate this aspect is to take a more abstract perspective by using topics 5 and 8 (Figure 10) as indicators for making the fundamental distinction between a qualitative and a quantitative approach to history.[76] Just as it has been the case with the dissemination of quantitative methods, the cultural turn has also affected only a sub-sample of our journals, particularly those which were mostly non-quantitative right from the beginning. Interestingly, though, *Geschichte und Gesellschaft*

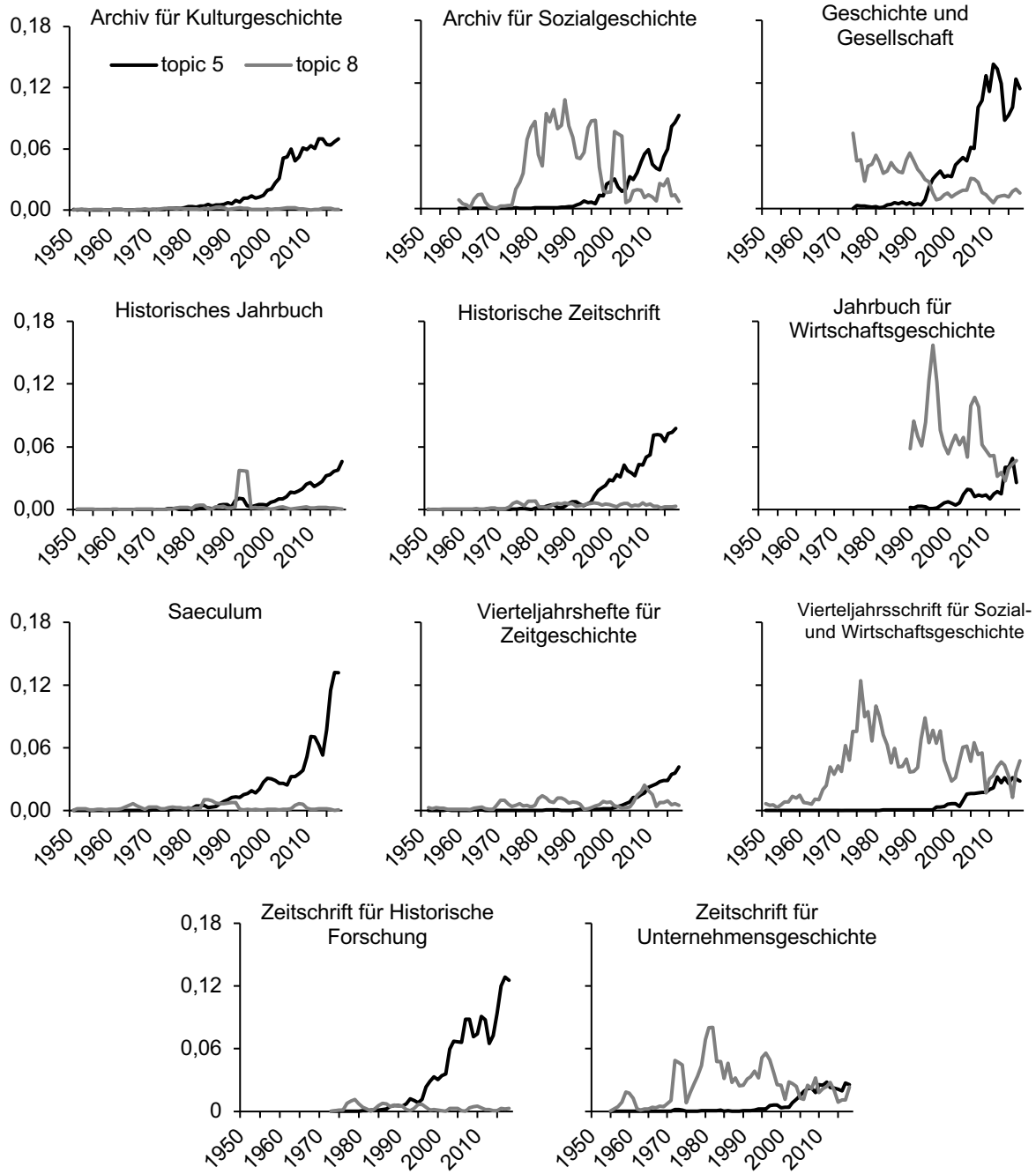
[74] James W. Cook, 'The Kids Are All Right: On the "Turning" of Cultual History', *The American Historical Review*, 117 (2012), pp. 746–771.Cook develops his story around the word frequency of "turn" in JSTOR.

[75] Search terms per graph from top left to bottom right: {Sprache, Sprachen, sprachlich*, linguistisch*}; {*kommunikation*, *kommunikativ*}; {*diskurs*};{*narrati*}; {*alltag*}; {*mentalität*, mental*}; {*akteur*}; {*identität*}; {*performa*}; {*symbol*}; {*ritual*}; {*praxis*, *praxen*, *praxeologi*};{Raums, Räume*, räumlich*, spatial}; {*global*}; {Bild*, Bildnis*, Symbol*, symbolisch*, visuell*, iconic}; {turn}. Asterisks mark wild cards.

[76] We do not think that this distinction between qualitative and quantitative research is useful whatsoever, let alone desirable; it is, however, de facto the dividing line separating two camps of historians. See, e.g., Buchner, Jopp, Spoerer, and Wehrheim, 'Zur Konjunktur des Zählens – oder wie man Quantifizierung quantifiziert. Eine empirische Analyse der Anwendung quantitativer Methoden in der deutschen Geschichtswissenschaft'; Michael Piotrowski and Mateusz Fafinski, 'Nothing New Under the Sun? Computational Humanities and the Methodology of History', in Folgert Karsdorp, Adina McGillivray, and Melvin Wevers, eds., *CHR2020: Proceedings of the Workshop on Computational Humanities Research* (Amsterdam, 2020), pp. 171–181; Ruggles and Magnuson, 'The History of Quantification in History: The JIH as a Case Study'.

as the flagship of *Historische Sozialwissenschaft* shows the highest share of topic 5 (*cultural history*), indicating that even German social history must be regarded as a rather non-quantitative matter, at least since the 1990s.

Fig. 10 Journal comparison quantitative vs. qualitative history



Notes: Topic 5 cultural history, topic 8 quantitative analysis. Three-year centered moving averages. Source: authours' own depicitions.

This claim is confirmed if we can take the "quant vs. qual" distinction one step further. We do so by addressing the question whether these two approaches to history are connected to similar or to different research themes. In Table 6, we summarized those topics which show a high co-occurrence to topic 5 (*cultural history*, Panel A) and topic 8 (*quantitative analysis*, Panel B),

respectively. The table can be read as follows. The four columns report on the top-10 topics that can be found in articles containing topic 5 (8). Each column represents a different amount of topic 5 (8). For example, 917 articles in our corpus exhibit a share of topic 5 of between five to twenty percent. For these articles, the most important co-occurring topic is *Social History* followed by *Structures*. If we instead consider the 26 articles that include a share of topic 8 of more than 50 percent, the most important co-occurring topic is topic 30 *Economic Development & Order*.

If we compare both panels of Table 6, several aspects stand out. Firstly, almost half of the entries in Panel A consist of topics from the main topic *Historiography* (topics in italics), whereas in Panel B, only 14 out of 40 topics are part of this main topic. In other words, articles with a high share of *cultural history* tend to include also other abstract topics; articles containing *quantitative analysis*, in contrast, are more associated with content-related topics. Secondly, and rather surprisingly, *cultural history* is strongly linked to *social history*, which is the most important topic in all four classes, whereas *social history* is less important for articles using quantitative analysis. Thirdly, *Source-criticism* ranks among the highest places in both panels, which shows that a thorough account on the analyzed sources as the basis of every historiographic endeavor is indeed the binding element of both quantitative and qualitative approaches. Furthermore, both approaches share a high importance of topic 1 *Structures.*

Tab. 6 Ten topics most frequently co-occurring with topics "cultural history" (#5) and "quantitative analysis" (#8)

Rank	Panel A: Weight of the topic "cultural history" in the article-level topic distribution by class			
	5%–20% (917 articles)	20%–35% (94 articles)	35%–40% (21 articles)	> 50% (4 articles)
1.	*3: Social History (8.1%)*	*3: Social History (12.7%)*	*3: Social History (15.8%)*	*3: Social History (13.3%)*
2.	*1: Structures (7.5%)*	*2: Source-criticism (6.5%)*	*2: Source-criticism (5.7%)*	17: United Kingdom (5.3%)
3.	*2: Source-criticism (4.9%)*	*1: Structures (5.4%)*	*1: Structures (4.7%)*	*2: Source-criticism (4.6%)*
4.	17: United Kingdom (3.3%)	17: United Kingdom (3.4%)	59: Art (3.5%)	18: France (2.7%)
5.	79: Artifact 4 (3.0%)	59: Art (2.8%)	*9: Theory & History (2.5%)*	*9: Theory & History (2.5%)*
6.	72: Colonialism (2.6%)	*9: Theory & History (2.6%)*	17: United Kingdom (2.3%)	*1: Structures (2.3%)*
7.	11: Democracy (2.6%)	79: Artifact 4 (2.4%)	*6: Philosophy (2.2%)*	59: Art (2.0%)
8.	57: Reflection (2.5%)	53: Media (2.3%)	*0: Rise & Fall (1.8%)*	72: Colonialism (1.8%)
9.	*0: Rise & Fall (2.4%)*	72: Colonialism (2.1%)	57: Reflection (1.5%)	61: Pre-History (1.8%)
10.	53: Media (2.3%)	57: Reflection (2.1%)	62: Christianity (1.2%)	*6: Philosophy (1.3%)*

Rank	Panel B: Weight of the topic "quantitative analysis" in the article-level topic distribution by class			
	5%–20% (518 articles)	20%–35% (102 articles)	35%–40% (53 articles)	> 50% (26 articles)
1.	*1: Structures (6.9%)*	*2: Source-criticism (6.8%)*	*2: Source-criticism (6.3%)*	30: Econ. Dev. & Order (7.3%)
2.	32: Labor Market (5.2%)	30: Econ. Dev. & Order (5.7%)	40: Social Structure (4.3%)	*2: Source-criticism (5.9%)*
3.	*2: Source-criticism (5.1%)*	42: Agriculture (5.1%)	*1: Structures (4.1%)*	*1: Structures (3.4%)*
4.	31: (War-) Economies (4.8%)	*1: Structures (4.8%)*	32: Labor Market (3.9%)	45: Municip. & Region (2.6%)
5.	30: Econ. Dev. & Order (4.6%)	32: Labor Market (4.6%)	30: Econ. Dev. & Order (3.9%)	32: Labor Market (2.5%)
6.	*0: Rise & Fall (4.5%)*	40: Social Structure (4.1%)	45: Municip. & Region (3.4%)	31: (War-) Economies (2.4%)
7.	45: Municip. & Region (3.8%)	*0: Rise & Fall (3.4%)*	*0: Rise & Fall (3.3%)*	*0: Rise & Fall (2.1%)*
8.	42: Agriculture (3.8%)	45: Municip. & Region (3.3%)	42: Agriculture (3.1%)	*3: Social History (1.8%)*
9.	40: Social Structure (3.0%)	*3: Social History (2.8%)*	31: (War-) Economies (2.9%)	42: Agriculture (1.6%)
10.	44: Family & Sex (3.0%)	31: (War-) Economies (2.8%)	44: Family & Sex (2.4%)	17: United Kingdom (1.5%)

Notes: Topics in italics are part of the main topic *Historiography*. Sources: authors' own calculations.

6. Conclusion

After all the topics and figures, what do our results tell about the history of German historiography? First of all, our analysis has shown that most research topics have been covered rather constantly, with some trends at the micro level of individual topics. For example, research on German history has fluctuated over time, as the main topic *Germany* indicates. When we take the macro perspective, the characteristic feature of our corpus is a high degree of continuity. There are, however, also some fundamental changes, above all the establishment of *Historische Sozialwissenschaft* which changed historians' focus from political to social history and from the (often heroical) individual to the masses. This social turn was not, as it is sometimes claimed, accompanied by a general quantitative turn; a notable increase in the use of quantitative methods can be observed only for certain journals from economic and social history. Other journals, such as the prestigious *Historische Zeitschrift*, show almost no signs of quantification. As the topic model has indicated, articles on cultural history are instead highly associated with a social history approach. Contrary to the common notion of social and cultural history being two separate fields, our evidence suggests a convergence of both concepts. However, substantiating this hypothesis requires further research. When it comes to the cultural turn, our results indicate that this general shift towards culturalist analysis was accompanied by a focus on micro-history, an increasing emphasis on the category of gender, and a growing importance of global and colonial history – shifts that may very well justify the denomination as turns. The

timing of the cultural turn, however, is somewhat delayed compared to what is put forward in other studies which normally date it to the 1980s.[77] Our results suggest that the cultural turn must be, at least for German historiography, considered as a rather general, heterogeneous process as compared to the social turn of the 1970s, which seems to have had a more clear-cut impact. The evidence presented above also suggests that the cultural turn set in much less abruptly than the social turn. For the other turns, that is, the iconic, performative, and spatial turn, the evidence is less clear, although they might have impacted the discipline in other ways. To us, these turns rather seem to express certain trends in framing one's research, thus confirming Iggers' hypothesis.[78] Or as Peter Schöttler puts it:

> "As we know by now, any topic can be rhetorically 'tuned up' or 'turned up' when it comes to making academic debates seem trendy, but also to stylize them as a turn into a priority that absolutely must be supported institutionally and financially."[79]

In conclusion, we think that with digitization there is the next serious turn about to come and that it will change the way historians explore the past. With this paper, we hope to make a small contribution to such a digital turn.

[77] This lag may be explained by editorial policy. It could be that the editors of the journals in our corpus were recruited from the "old guard" influenced by the *Historische Sozialwissenschaft* and were succeeded by younger culturalist rather late. The aspect of editorship is, in general, a rather promising one, which we plan to implement in a subsequent paper.

[78] See above.

[79] "*Überhaupt kann man jedes Themenfeld, wie wir inzwischen wissen, rhetorisch 'auftunen' bzw. 'aufturnen', wenn es darauf ankommt, akademische Debatten nicht nur trendy erscheinen zu lassen, sondern eben als turn zu einer Priorität zu stilisieren, die unbedingt institutionell und finanziell unterstützt werden muss.*" Schöttler, *Geschichtswissenschaft vor und nach dem 'linguistic turn'*, p. 15. He continues: *„Überhaupt die Aufschriften und big names: Was wird nicht alles mit Diskurs und Mentalität, mit Foucault oder Derrida oder Bourdieu garniert!"* (p. 157).

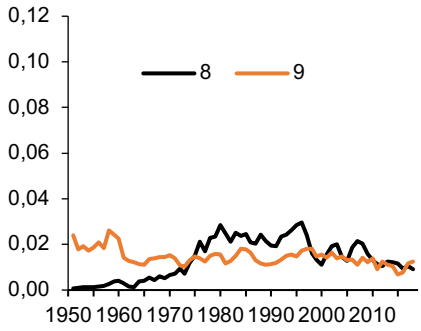
7. Online Appendix

Fig. A-1 Topics and their development grouped by main topics

Historiography

Quantitative Analysis (8)

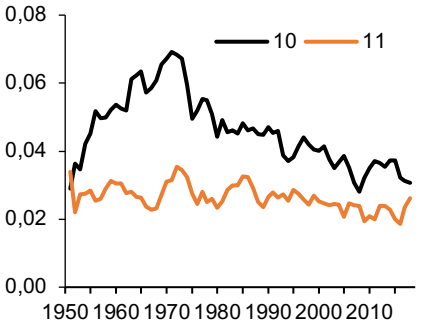
Theory & History (9)



Politics

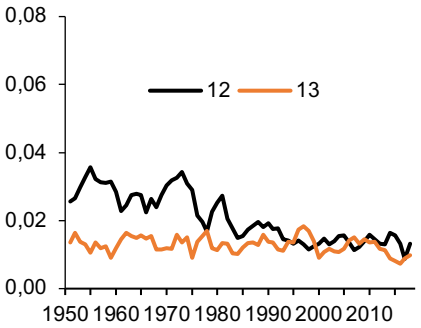
Governmental Action (10)

Democracy (11)

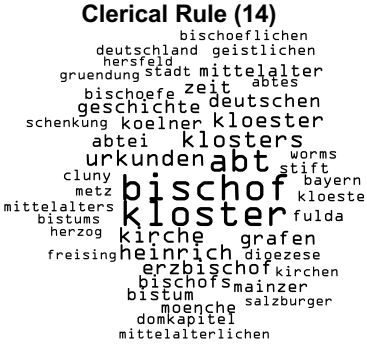


Foreign Affairs (12)

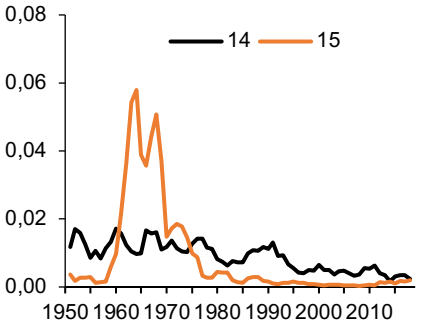
Secular Rule (13)



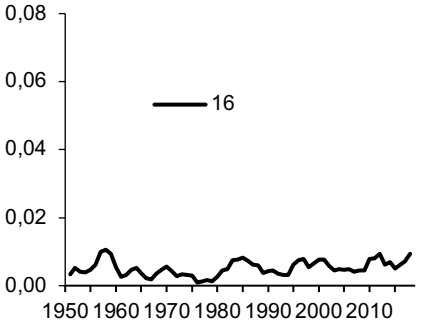
Clerical Rule (14)



Socialist Thought (15)



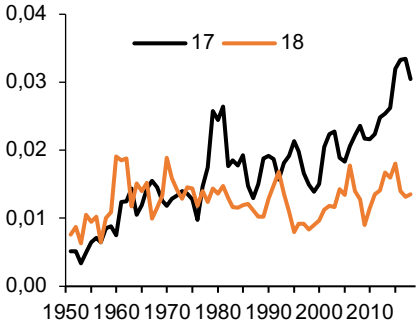
Political Ideas (16)



Geographic Entities

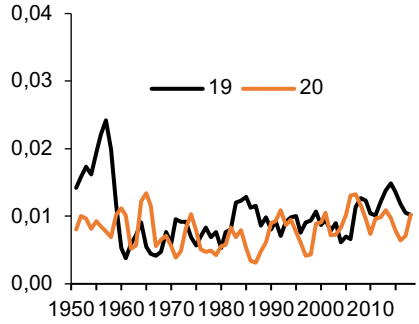
United Kingdom (17)

France (18)



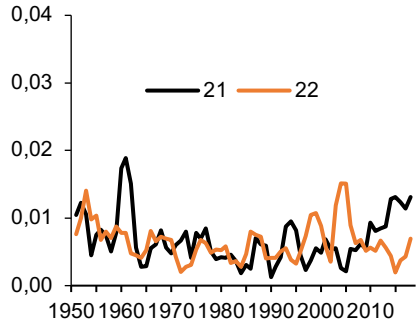
Ancient World (19)

Italy (20)



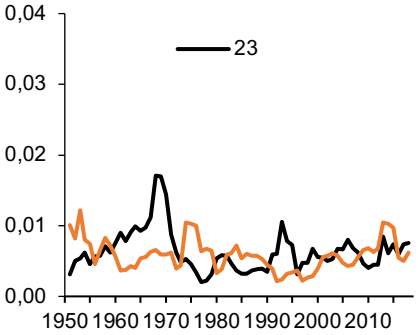
Ibero-America (21)

Russia/USSR (22)



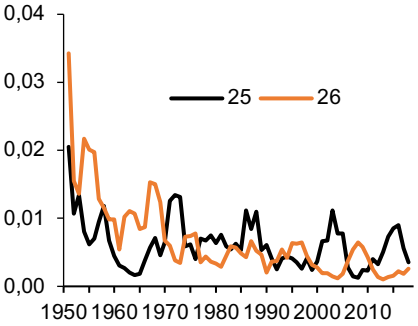
Austria/Habsburg Monarchy (23)

Islamic World (24)



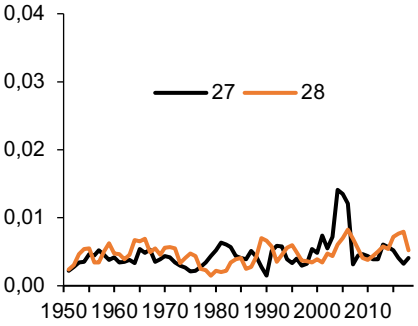
East Asia (25)

Ancient Oriental Studies (26)

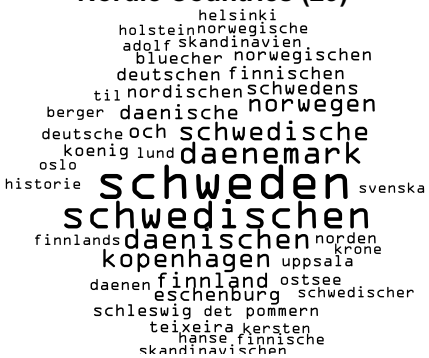


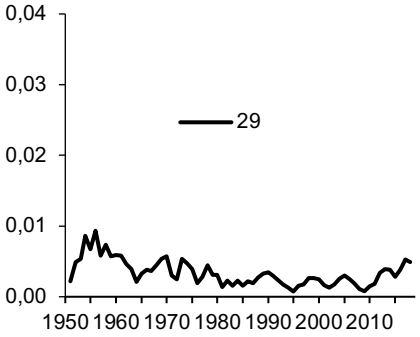
Poland (27)

North America (28)



Nordic Countries (29)

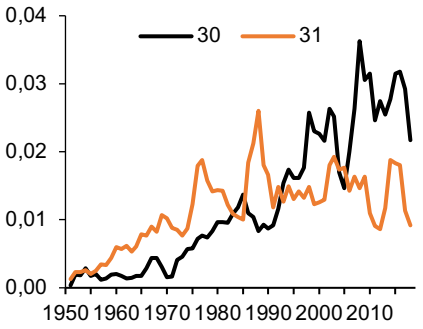




Economy

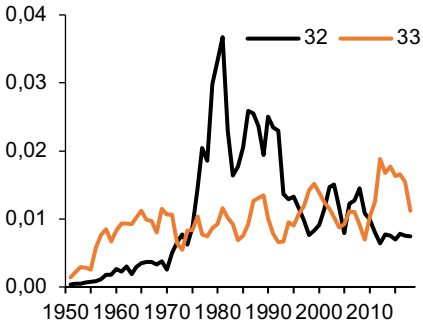
Econ. Development & Order (30)

(War-) Economies (31)



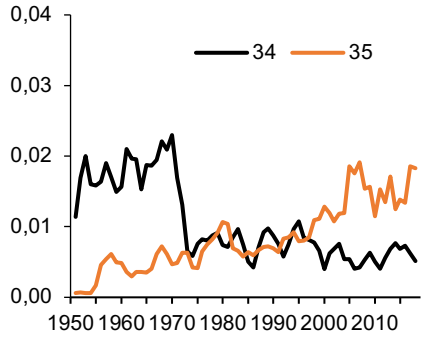
Labor Market (32)

Money & Credit (33)



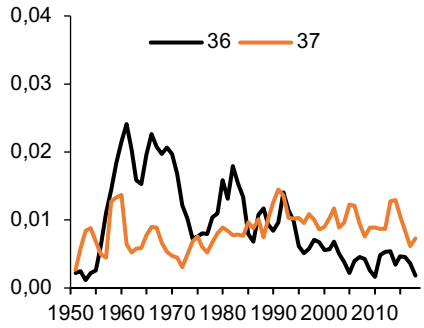
Early Modern Trade (34)

Business (35)

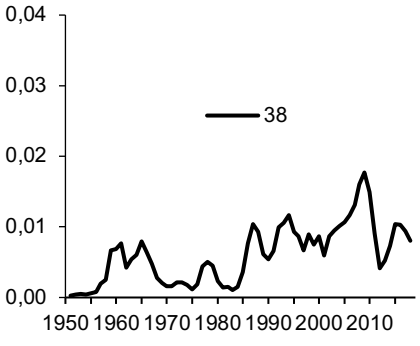


Industry (36)

Urban Economy (37)



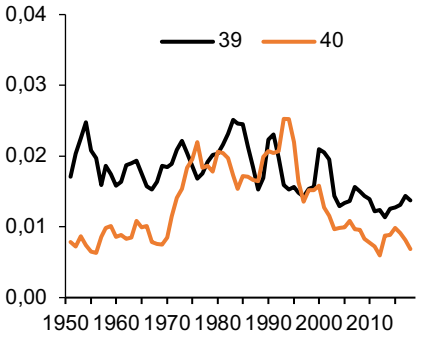
Technology (38)



Society

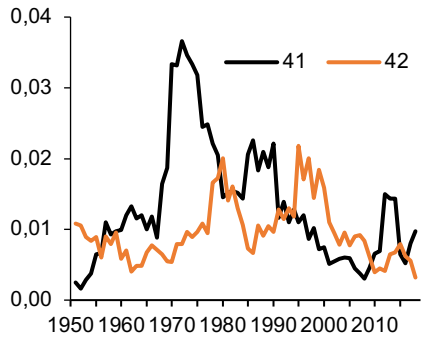
Constitution (39)

Social Structure (40)



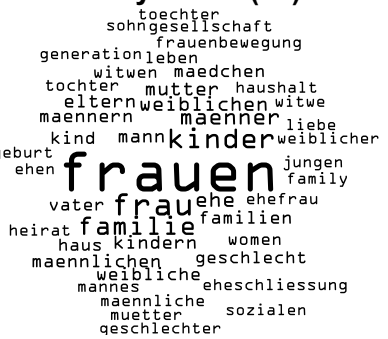
Socialism (41)

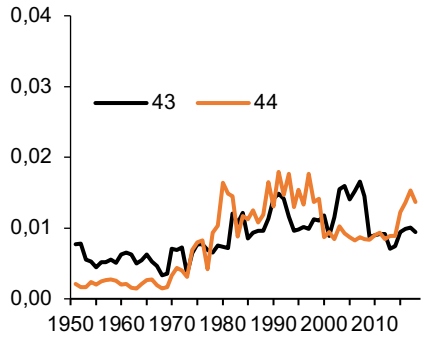
Agriculture (42)



Nobility (43)

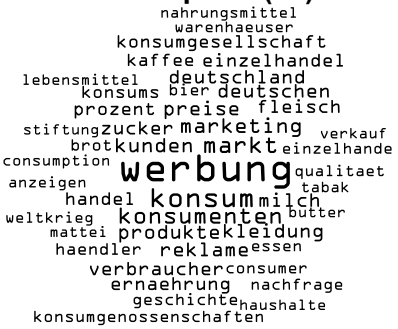
Family & Sex (44)

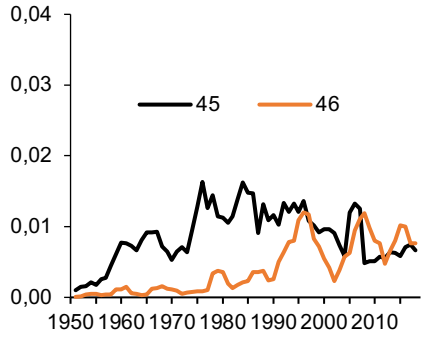




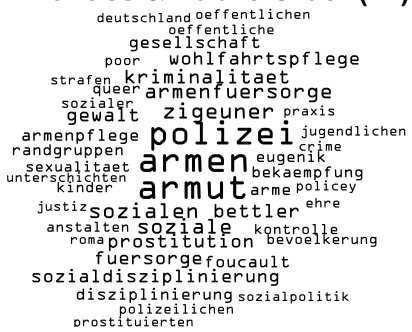
Municipality & Region (45)

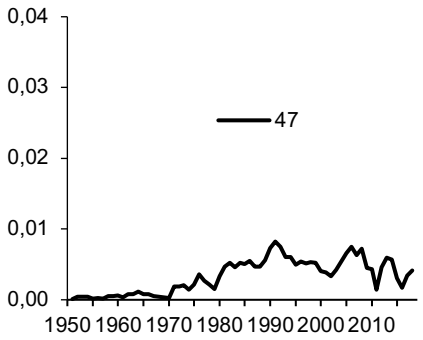
Consumption (46)





Minorities & Public Order (47)

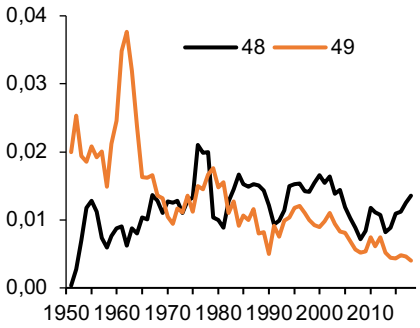




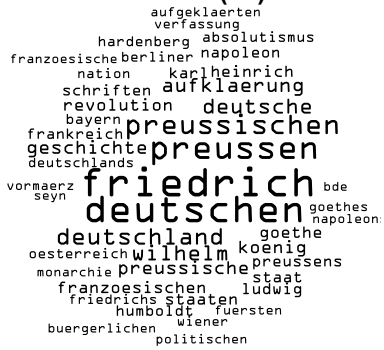
Germany

National Socialism (48)

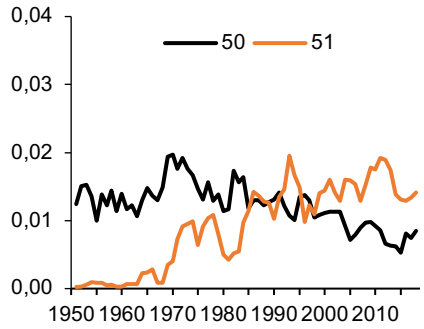
HRE Middle Ages (49)



Vormärz (50)

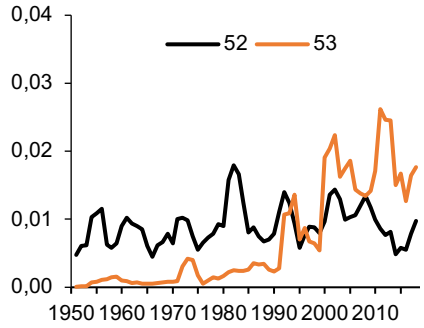


Federal Republic (51)



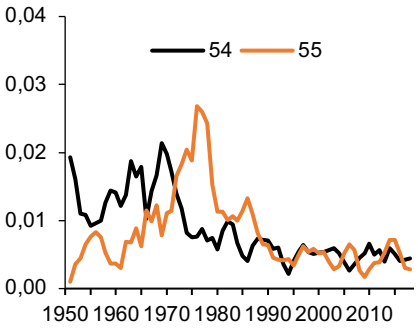
HRE Early Modern (52)

Media (53)

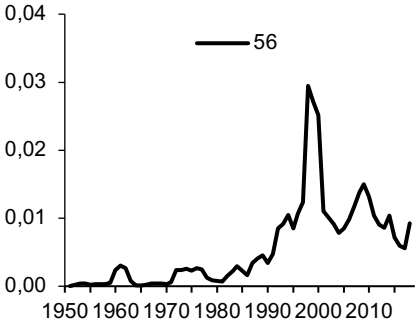


German Empire (54)

Weimar Republic (55)



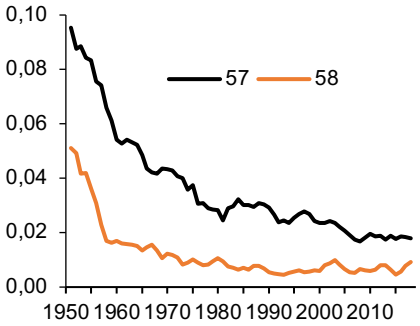
GDR (56)



Single Topics

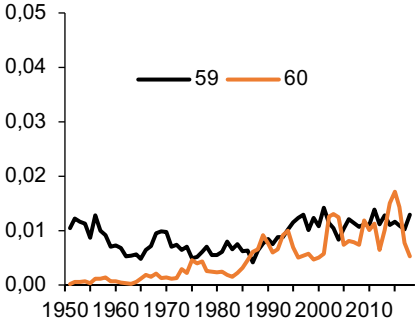
Reflection (57)

(Migration of) Peoples (58)

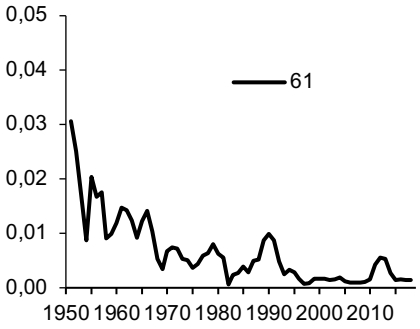


Art (59)

Medicine (60)



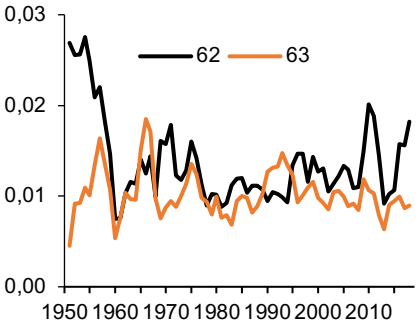
Prehistory (61)



Faith and Religion

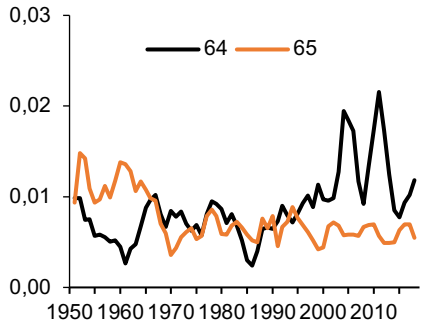
Christianity (62)

Relig. Beliefs Middle Ages (63)



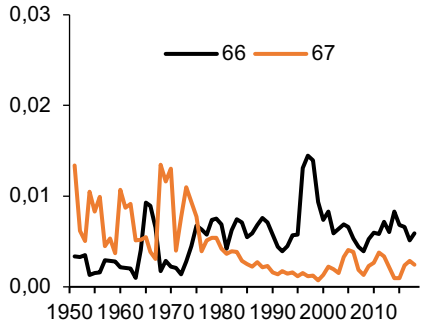
Catholic Church (64)

Papacy (65)

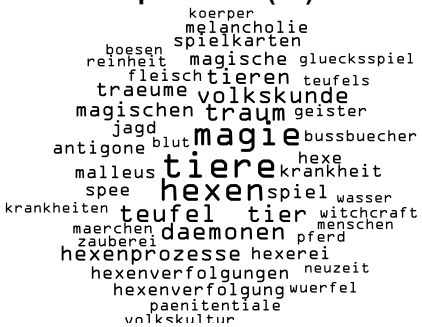


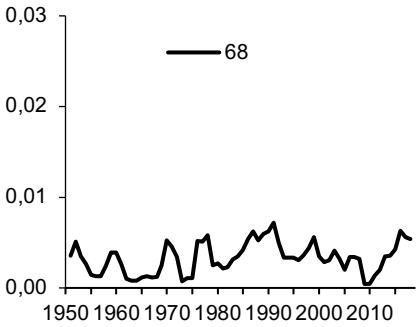
Judaism (66)

Buddhism & Hinduism (67)



Superstition (68)

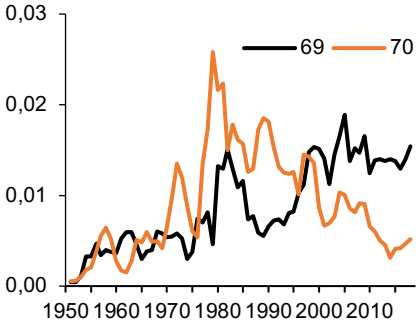




Conflict and Violence

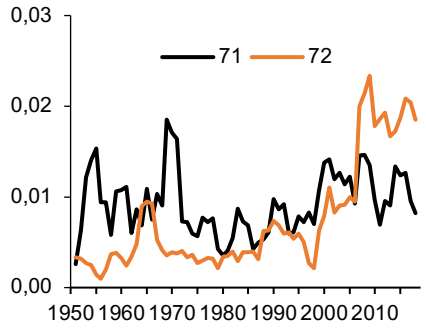
Holocaust (69)

Post-War Order (70)



World War II (71)

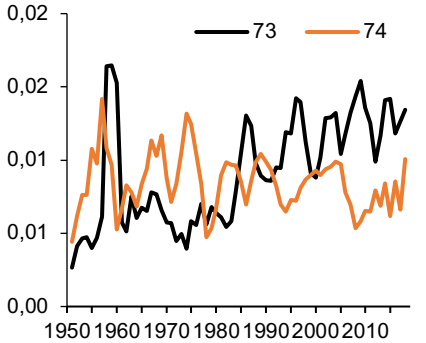
Colonialism (72)

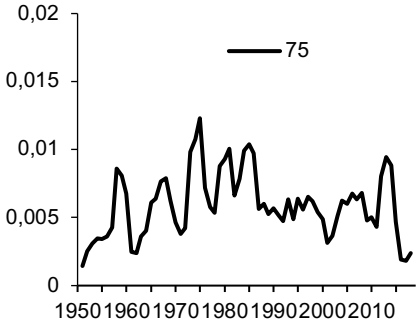


Knowledge

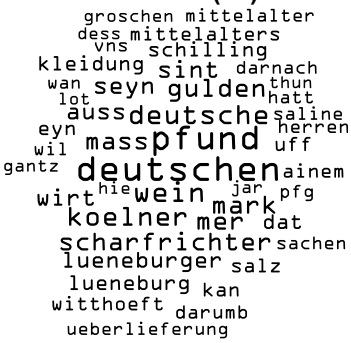
Science (73)

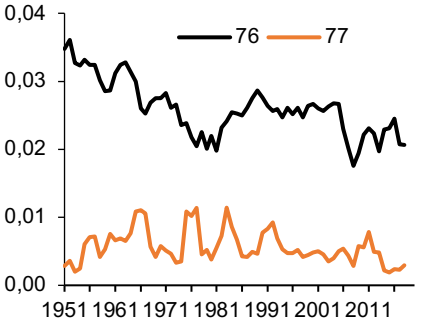
Enlightenment (74)

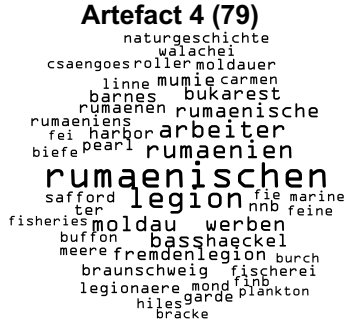


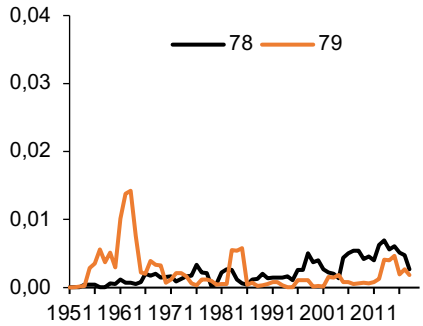


Artefact









Notes: Annual topic shares, three-year centered moving averages; realigned topic numbers.
Source: authors' own depiction.

Fig. A-2 Topic shares per journal

	AfK	AfS	GG	HJ	HZ	JWG	Saec	VfZ	VSWG	ZHF	ZUG
0: Rise & Fall	0,05	0,05	0,05	0,06	0,08	0,04	0,07	0,06	0,06	0,04	0,06
1: Structures	0,02	0,08	0,08	0,04	0,04	0,09	0,03	0,05	0,04	0,05	0,06
2: Source Criticism	0,07	0,03	0,05	0,05	0,06	0,04	0,08	0,04	0,05	0,06	0,03
3: Social History	0,03	0,03	0,08	0,01	0,03	0,03	0,04	0,01	0,02	0,04	0,01
4: Biographies	0,04	0,03	0,01	0,03	0,02	0,01	0,02	0,03	0,03	0,02	0,07
5: Cultural History	0,02	0,02	0,05	0,01	0,02	0,01	0,02	0,01	0,01	0,04	0,01
6: Philosophy	0,04	0,00	0,01	0,01	0,02	0,01	0,06	0,01	0,00	0,01	0,00
7: Latin Sources	0,05	0,00	0,00	0,05	0,01	0,00	0,01	0,00	0,01	0,03	0,00
8: Quant. Analysis	0,00	0,03	0,02	0,00	0,00	0,07	0,00	0,01	0,04	0,00	0,02
9: Theory & History	0,02	0,00	0,02	0,01	0,03	0,00	0,02	0,01	0,01	0,01	0,00
10: Governmental Action	0,02	0,05	0,03	0,05	0,05	0,03	0,02	0,11	0,03	0,03	0,04
11: Democracy	0,01	0,03	0,05	0,02	0,04	0,01	0,02	0,04	0,01	0,01	0,00
12: Foreign Affairs	0,01	0,01	0,01	0,02	0,04	0,01	0,01	0,04	0,01	0,01	0,01
13: Secural Rule	0,03	0,00	0,00	0,04	0,02	0,00	0,01	0,00	0,01	0,04	0,00
14: Clerical Rule	0,02	0,00	0,00	0,04	0,01	0,00	0,00	0,00	0,02	0,01	0,00
15: Socialist Thought	0,00	0,05	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
16: Political Ideas	0,01	0,00	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,02	0,00
17: United Kindgom	0,02	0,02	0,03	0,01	0,02	0,02	0,01	0,01	0,02	0,02	0,02
18: France	0,01	0,01	0,01	0,02	0,02	0,01	0,01	0,01	0,01	0,03	0,00
19: Ancient World	0,02	0,00	0,00	0,00	0,03	0,00	0,02	0,00	0,00	0,00	0,00
20: Italy	0,01	0,01	0,00	0,01	0,01	0,00	0,00	0,01	0,01	0,02	0,00
21: Ibero-Amercia	0,01	0,00	0,01	0,01	0,00	0,00	0,01	0,00	0,02	0,01	0,00
22: Russia / USSR	0,00	0,01	0,01	0,00	0,01	0,00	0,01	0,01	0,01	0,00	0,00
23: Austria / Habsburg Monarchy	0,00	0,01	0,00	0,01	0,00	0,01	0,00	0,01	0,01	0,00	0,01
24: Islamic World	0,00	0,00	0,00	0,00	0,00	0,00	0,03	0,00	0,00	0,01	0,00
25: East Asia	0,00	0,00	0,00	0,00	0,00	0,00	0,03	0,00	0,00	0,00	0,00
26: Ancient Oriental Studies	0,00	0,00	0,00	0,00	0,01	0,00	0,04	0,00	0,00	0,00	0,00
27: Poland	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,01	0,00	0,01	0,00
28: North Amercia	0,00	0,00	0,01	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,00
29: Nordic Countries	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00
30: Economic Development & Order	0,00	0,02	0,03	0,00	0,01	0,11	0,00	0,01	0,03	0,00	0,02
31: (War-) Economies	0,00	0,01	0,01	0,00	0,00	0,06	0,00	0,02	0,04	0,00	0,05
32: Labor Market	0,00	0,05	0,02	0,00	0,00	0,02	0,00	0,01	0,02	0,00	0,02
33: Money & Credit	0,00	0,01	0,01	0,00	0,00	0,05	0,00	0,01	0,04	0,00	0,05
34: Early Modern Trade	0,00	0,00	0,00	0,00	0,00	0,02	0,01	0,00	0,07	0,01	0,03
35: Business	0,00	0,00	0,00	0,00	0,00	0,04	0,00	0,00	0,02	0,00	0,09
36: Industry	0,00	0,01	0,01	0,00	0,00	0,03	0,00	0,00	0,03	0,00	0,08
37: Urban Economy	0,01	0,00	0,00	0,01	0,01	0,01	0,00	0,00	0,03	0,04	0,01
38: Technology	0,00	0,00	0,01	0,00	0,00	0,03	0,00	0,00	0,01	0,00	0,06
39: Constitution	0,01	0,01	0,01	0,02	0,02	0,01	0,01	0,02	0,02	0,04	0,01

	AfK	AfS	GG	HJ	HZ	JWG	Saec	VfZ	VSWG	ZHF	ZUG
40: Social Structure	0,01	0,02	0,03	0,00	0,01	0,01	0,01	0,00	0,02	0,01	0,01
41: Socialism	0,00	0,06	0,02	0,00	0,01	0,00	0,00	0,02	0,00	0,00	0,00
42: Agriculture	0,00	0,01	0,01	0,00	0,00	0,04	0,01	0,00	0,04	0,01	0,00
43: Nobility	0,01	0,00	0,01	0,02	0,01	0,00	0,00	0,00	0,02	0,05	0,00
44: Family & Sex	0,01	0,02	0,02	0,00	0,00	0,01	0,01	0,00	0,01	0,01	0,01
45: Municipality & Region	0,00	0,03	0,01	0,00	0,00	0,01	0,00	0,01	0,02	0,00	0,02
46: Consumption	0,00	0,01	0,00	0,00	0,00	0,03	0,00	0,00	0,01	0,00	0,02
47: Minorities & Public Order	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00
48: National Socialism	0,00	0,01	0,02	0,01	0,01	0,00	0,00	0,05	0,01	0,00	0,01
49: HRE Middle Ages	0,03	0,00	0,00	0,04	0,03	0,00	0,01	0,00	0,00	0,00	0,00
50: Vormärz	0,02	0,01	0,01	0,02	0,02	0,01	0,00	0,00	0,01	0,02	0,01
51: Federal Republic	0,00	0,02	0,01	0,01	0,00	0,01	0,00	0,05	0,01	0,00	0,00
52: HRE Early Modern	0,01	0,00	0,00	0,03	0,01	0,00	0,00	0,00	0,01	0,05	0,00
53: Media	0,00	0,03	0,01	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00
54: German Empire	0,00	0,01	0,01	0,01	0,02	0,00	0,00	0,01	0,00	0,00	0,01
55: Weimar Republic	0,00	0,01	0,01	0,00	0,01	0,01	0,00	0,03	0,01	0,00	0,01
56: GDR	0,00	0,02	0,01	0,00	0,00	0,01	0,00	0,02	0,00	0,00	0,01
57: Reflection	0,07	0,02	0,02	0,04	0,05	0,01	0,06	0,02	0,01	0,02	0,01
58: (Migration of) Peoples	0,01	0,00	0,00	0,01	0,02	0,00	0,04	0,00	0,01	0,01	0,00
59: Art	0,03	0,00	0,01	0,01	0,01	0,00	0,01	0,00	0,00	0,01	0,01
60: Medicine	0,00	0,01	0,01	0,00	0,00	0,01	0,00	0,01	0,01	0,00	0,01
61: Prehistory	0,00	0,00	0,00	0,00	0,00	0,00	0,04	0,00	0,00	0,00	0,00
62: Christianity	0,02	0,00	0,01	0,03	0,01	0,00	0,03	0,00	0,00	0,03	0,00
63: Rel. Beliefs Middle Ages	0,03	0,00	0,00	0,02	0,01	0,00	0,01	0,00	0,00	0,01	0,00
64: Catholic Church	0,00	0,01	0,01	0,05	0,01	0,00	0,00	0,01	0,00	0,00	0,00
65: Papacy	0,01	0,00	0,00	0,04	0,01	0,00	0,00	0,00	0,00	0,01	0,00
66: Judaism	0,00	0,01	0,01	0,00	0,01	0,00	0,01	0,01	0,00	0,00	0,00
67: Buddhism & Hinduism	0,00	0,00	0,00	0,00	0,00	0,00	0,03	0,00	0,00	0,00	0,00
68: Superstition	0,01	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,01	0,00
69: Holocaust	0,00	0,01	0,01	0,00	0,00	0,01	0,00	0,05	0,00	0,00	0,00
70: Post-War Order	0,00	0,01	0,00	0,01	0,00	0,00	0,00	0,05	0,00	0,00	0,00
71: World War II	0,00	0,00	0,01	0,00	0,01	0,00	0,00	0,04	0,00	0,01	0,00
72: Colonialism	0,00	0,01	0,02	0,00	0,01	0,00	0,01	0,00	0,00	0,00	0,00
73: Science	0,01	0,01	0,01	0,01	0,01	0,01	0,00	0,01	0,01	0,00	0,01
74: Enlightenment	0,04	0,00	0,00	0,01	0,01	0,00	0,01	0,00	0,00	0,03	0,00
75: Education	0,01	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,01	0,01	0,00
76: Artefact 1	0,04	0,02	0,02	0,02	0,02	0,01	0,05	0,02	0,01	0,03	0,01
77: Artefact 2	0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02	0,02	0,00
78: Artefact 3	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00
79: Artefact 4	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Source: authors' own calculations.