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INTEGRATING QUANTITATIVE AND QUALITATIVE METHODS IN IDEOLOGY STUDIES: A CASE STUDY OF VICTORIAN IDEOLOGY ANALYSIS

Abstract

The paper provides an overview of both traditional and modern methodological approaches for the study of ideology, while showcasing the author's earlier research on Victorian ideology. It argues that the long-standing traditions of critical theory analysis, discourse analysis, and hermeneutics in ideology critique have created a rich legacy for conceptual categorization of knowledge about the organization and evolution of ideologies. This legacy has benefited contemporary, machine-assisted studies of ideologically laden textual data, offering valuable insights for operationalizing ideology.

The study focuses on the modern shift towards analyzing the emotional components of ideology, using the latest text and opinion mining techniques to explore the cognitive-emotive nature of relevant ideological categories. While advocating for an emotion-centered view of ideology organization, the paper proposes an alternative approach to ideology analysis by endorsing a blended methodology. This methodology integrates human-run qualitative discourse analysis with machine-assisted quantitative content analysis in the study of Victorian ideology.

The article presents an algorithm for ideological analysis, starting with data acquisition, choosing the methodological path, and demonstrating the efficacy of the co-occurrence network tool for computerized topic extraction at the conceptual macro-level of ideology analysis. Keywords are recontextualized at the microlevel of analysis to provide an in-depth view of the extracted quantitative metrics, seeking an interpretative approach. This approach encourages further triangulation of research tools and data sources to ensure the iterative nature of the research and solidify the hypotheses.

Keywords: ideological analysis, human-run and machine-assisted methodologies, blended methods.

Анотація

У статті запропоновано огляд традиційних і сучасних методологічних підходів до вивчення ідеології з урахуванням попередніх робіт автора щодо вікторіанської ідеології. Підтверджено, що традиції критичного аналізу теорії, дискурсивного аналізу та герменевтики у вивченні ідеології створили багату спадщину для концептуальної категоризації знань про організацію та еволюцію ідеологій. Ця спадщина сприяла сучасним автоматизованим дослідженням текстових даних з ідеологічним змістом, надаючи цінні установки для операціоналізації ідеологій.

Стаття зосереджена на сучасному зсуві до аналізу емоційних компонентів ідеології, де використано новітні методи інтелектуального й оцінного аналізу тексту у вивченні когнітивно-емоційної природи ідеологічних категорій. Водночас дослідження сфокусоване на емоційно-центрованій моделі організації ідеології, запропоновано альтернативний підхід до її аналізу, що базується на змішаній методології дослідження. Ця методологія поєднує якісний неавтоматизований дискурсивний аналіз із машинним контент-аналізом у вивченні вікторіанської ідеології.

Представлено алгоритм вивчення ідеології, починаючи з етапу отримання даних, вибору методологічного апарату та демонстрації ефективності корпусного інструменту колокацій для комп'ютеризованого генерування концептуально значущої тематики ідеології на макрорівні її аналізу. Ключові слова реконструюються на глибинному рівні дослідження для вивчення отриманих кількісних показників шляхом їхньої подальшої інтерпретації дослідником. Цей підхід передбачає подальшу тріангуляцію дослідницьких інструментів і баз даних для забезпечення повторюваності та вдосконалення дослідження з метою підтвердження або спростування гіпотези.

Ключові слова: аналіз ідеологій, автоматизовані та неавтоматизовані методології, змішані методи.

Introduction. The complexity of ideology, coupled with its attitudinal aspects, poses an epistemological dilemma for scholars striving to develop a coherent and comprehensive methodology for its critique. This challenge confronts analysts who employ both human-made and computer-aided analyses.

Traditionally, the study of ideology has been dominated by theorists in political philosophy (A. Smith, K. Marx and F. Engels, K. Mannheim, L. Althusser, S. Žižek, E. Laclau and Ch. Mouffe), political science (M. Freeden, G. Sartori), and the fields of politics and psychology (J. Haidt, J. Jost, G. Lakoff, S. Ahmed). From a linguistic perspective, Critical Discourse Analysis (N. Fairclough, R. Wodak, T. van Dijk) has prominently addressed the role of language as a social practice, which serves different interests and through which social relations and power dynamics are reproduced and contested. Meanwhile nowadays, texts of any format (written or spoken) have become an integral part of the methodological toolbox for the automated analysis and ideology critique especially prompted by the confluence of digital textual data and the consistent evolvement of computational power (Van Atteveldt et al., 2019; Zirn et al., 2016).

Conspicuously, existing ideology analyses are predominantly essentialist and analytical, focusing on the propositional aspects of ideology, while scholars draw upon their expertise, deep contextual understanding, and the ability to incorporate nuanced insights and intuition to grasp the subtleties of ideology. However, the psychological perspective has become increasingly significant for conceptual ideology modeling (Lakoff, 2002) and for understanding dispositional susceptibility to ideological thinking (Zmigrod, 2021). The recent recognition of increased "ideology emotionalization" in populist speeches (Bartscherer, 2022) underscores the need to include themes of emotion and affect in the conceptual study of ideology.

In their attempt to integrate the logical and attitudinal aspects of ideology in the computational analysis, Hirst et al. (2010) consider emotional content of political texts in the computer-based studies of parliament debates, while Barna and Dugan (2016) introduce cognitive-affective maps (CAMs) of media content (2014–2015) across several countries related to the escalation of conflict in Eastern Ukraine. These maps represent core topics as connoted negatively or positively, while the emotional gradation of the themes is reflected in key terms with strong, neutral, or ambivalent markers. The implementation of machine-based tools, such as KH Coder software and Sentiment Analysis (SA) for generating CAMs offers promising avenues for analysing conceptual clusters of ideology. Therefore, this study aims to provide an overview of the capabilities of KH Coder 3 software for quantitative and qualitative content analysis of textual data, with a focus on identifying the emotional components of ideologies through a case study of Victorian ideology. The material of the study is the data obtained in the author's previous computer-based analyses of the Corpus of Late Modern English Texts (CLMET 3.1) run with the aid of KH Coder 3 alongside analysis of the British English corpus utilizing Google Ngram Viewer.

The objectives of the paper include the following: 1) to consider existent ways to operationalize ideology, encompassing both propositional and psychological aspects; 2) to strategize the corpus design for machine-based text analysis; 3) to provide an overview of the computer-based methodology for the study of digital texts in the critique of ideology; 4) to demonstrate the utility of quantitative content analysis for making theme-level generalizations using KH Coder 3 software; and 5) to showcase the effectiveness of the triangulation research strategy in analyzing ideology.

Research methodology. The paper presents an analytical overview of existing procedural pathways to uncover the cognitive-emotional organization of ideologies using machine-assisted content analysis to complement qualitative discourse analysis. By employing a case study approach, it analyzes the efficiency of quantitative and qualitative analysis

of Victorian ideology utilizing the free online software KH Coder 3 and demonstrates alternative methodological approaches for the ideology analysis. This approach ensures a comprehensive examination of ideological research, integrating human insights with machine-driven measurements of key conceptual elements.

The general scientific methods of synthesis and analysis are employed to present a state-of-the-art overview of ideology critique, integrating both traditional findings and contemporary advancements. This approach skillfully positions computer-aided and human-made analyses within the broader scientific landscape of ideology analysis for large textual datasets. The categorization of existing methods for operationalizing ideologies emphasizes an integrated account of their logical and psychological aspects, while the validity and consistency of the research are ensured by maintaining a critical perspective on fully automated research processes.

A detailed descriptive account of the KH Coder 3 toolbox for machine-aided quantitative content analysis is provided, highlighting its application in outlining existing practices of corpus analysis in ideology studies. The paper advocates for a blended data-analysis approach, arguing for a sequential explanatory research design in the study of ideologically laden textual data. This approach aims to achieve triangulation by integrating quantitative and qualitative findings in contemporary ideology critique.

(How) is it possible to operationalize ideology for computer-based analysis? In the history of ideology studies, much effort has been dedicated to defining ideology and developing a network of concepts that form the mechanisms for the entrenchment of commonsensical knowledge (see Heywood, 2022). The rich legacy of traditional critique marks a clear divide between the propositional organization of ideology – its doctrinal and logocentric nature – and its functional perspective, which is subjectivized, heavily affectivized, and difficult to operationalize. This divide has resulted in two major approaches to researching agents' stances: analytical and psychoanalytical (see Pinich, 2019b).

Theoretical legacy in conceptualizing ideology. The propositional consistency of ideology, considered more reliable and plausible for operationalization, is grounded in the bedrock of ideological doctrines that form the set of beliefs critical and definitive of an ideology. These central themes constitute the very essence of an ideology, providing a solid basis for their classification and determining the place of other attributable commonplace concepts within them.

A conceptual framework for ideology analysis provides a template for the field-like circular organization of the ideological system of knowledge, ranging from core concepts and adjacent concepts to peripheral ones (see Freeden, 1996, pp. 77–82). The persistence of ideology is ensured by the fluidity of these conceptual clusters, which gain different value over time. While similar ideas for organizing the evolving conceptual system of ideology was demonstrated in other works (Lakoff, 2002; Mudde, 2007), this model was successfully implemented for analyzing the conceptual structure of *legal ideology* (Lees & Shepherd, 2018), *anarchism* (see Franks et al., 2018), and *populism* (Stanley, 2008).

An inventory of the most significant clusters of ideas, accompanied by ideological values, according to the conceptual approach forms the core of ideologies. These constructs result from meticulously conducted encyclopedic analyses of the most prominent literature in the field of ideology critique, synthesized by scholars into constellations of key concepts. For instance, INDIVIDUALISM, LIBERTY, and HUMAN RATIONALITY form the nexus of central ideas for *liberalism*. JUSTICE, RIGHTS, and DEMOCRACY closely align with and help implement these core concepts, while peripheral concepts like WELFARE, PROPERTY, and MARKET ECONOMY add nuance and adaptability to the ideology (Freeden, 1996).

The role of emotions in shaping society was consistently examined in the philosophy of emotions. Slaby and von Scheve (2019) argue the social-forming function of political affect within "affective communities" where the overall social organization is governed by "emotional coherence" (Thagard, 2006) leading to natural ideological alignment and further sustenance of ideological convictions and beliefs. This perspective places emotions at the center of the dynamic evolution of ideology (Pinich, 2020), while ideologemes that constitute the conceptual network of ideology form its axis and include: 1) ideological values: highlighting human rights, such as *life*, *liberty*, *property*, *safety*, *individual freedom*, *the pursuit of happiness*, *justice*, *labor*, and *equality*; 2) cardinal virtues: including *charity*, *philanthropy*, and *tolerance*; 3) ethical and aesthetical judgments: which involve the categorization of knowledge around concepts of *goodness* and *badness*, *appropriateness* and *inappropriateness*, *valuableness* and *invaluableness*, along with the deontic moral categories of *obligatoriness*, *optionality*, and *wrongness*; 4) ideological convictions: encompassing *trustworthiness*, *justice*, *credibility*, *rationality*, *acceptance*, and *certainty* (beyond facts); 5) emotional ideologemes: ranging from moral emotions (*anger*, *indignation*, *shame*, *guilt*, *sympathy*, *gratitude*, *pride*, etc.) to historically and locationally specific moods, emotional states, and affects.

The study on the conceptual network of Victorian ideology places emotional ideologemes at the core of its ideological dimensions, aiming to explore their connectivity patterns amidst contemporary mood fluctuations, spanning from positive (Pinich, 2018b) to negative polarity (Pinich, 2018a). This analysis is informed by an inventory of moral emotions (Haidt, 2003), which serves as input for automated analysis to observe co-occurrence patterns between emotional terms and propositional ideological elements, potentially forming clusters of ideological themes encompassing religion, morality, education, science, politics, law, social dynamics, family, and gender.

These integrative practices of blended quantitative and qualitative analysis constitute the foundation of modern machine-aided ideological analyses.

Integrating human and machine approaches in ideological analysis. Manually identified constituents of the conceptual organization of ideologies serve as the starting point for machine-aided analysis of textual data. Modern computational studies can either focus on testing the accuracy of critical topics for a specific time period, provide ideological annotation of political texts based on the preliminary ideological topology (Sim et al., 2013) (see Figure 1), and subsequently generate the ideological books corpus (https://people.cs.umass.edu/~miyyer/ibc/index.html), or aim at producing approximated lists of topical themes for the subsequent conceptual ideological analysis (Aksenov et al., 2021; Zirn et al., 2016).

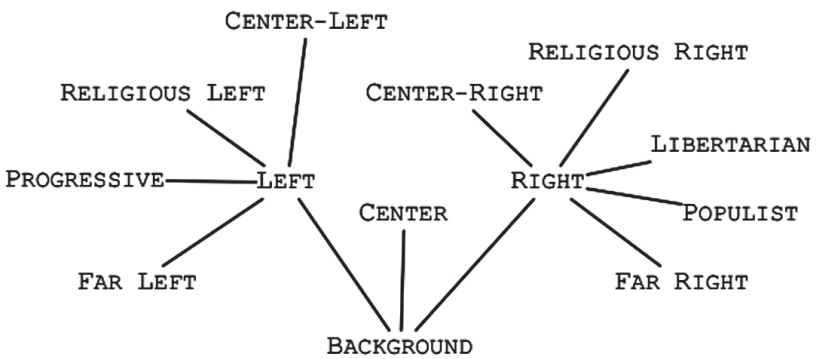

Fig. 1. **Ideology tree showing the labels for ideological corpus**
Source: Sim et al., 2013

Corpus-driven automated analyses of text data rely on machine-run quantitative content analysis and text-mining techniques to produce plausible association lists of keywords, topics, and concepts, further utilized in various fields of knowledge, information extraction, and processing. This approach has evolved into a promising field of Natural Language Processing (NLP), a multi-faceted study of language feature extraction and generation, which requires special training for researchers in other fields who are, for the most part, agnostic of NLP affordances in their textual data analysis (Glavaš et al., 2019).

Some of the research tasks in NLP that have prospective implications for ideology studies include: Automatic Summarization (producing understandable summaries of text sets and providing summaries or detailed information of known text types), Co-Reference Resolution (identifying all words in a sentence or larger text that refer to the same object), Discourse Analysis (identifying the discourse structure of connected text, studying text in relation to its social context), Named Entity Recognition (NER) (used for information extraction to recognize named entities and classify them into different categories), and Sentiment Analysis (SA) (identifying the emotional polarity of texts and providing a detailed specification of the emotions conveyed) (see Khurana et al., 2023).

The promising potential of machine-run analysis for ideologically laden texts, along with claims about its increased accuracy (Bayram et al., 2019) and the potential for inferencing the intensity of ideological beliefs (Zmigrod, 2022), has left some NLP researchers cautious about the correctness of the statistical algorithms used in co-occurrence extraction and analysis (Korzycki et al., 2017). This caution invites the use of comparative and mixed methodologies, ensuring the inclusion of human interpretation alongside quantitatively obtained results.

Consequently, contemporary corpus-based ideology studies frequently involve a harmonious blend of human and computer-assisted methodologies, where human discourse analysis is inextricably integrated into the validation of machine-generated results (see Bartscherer, 2022; Custodi, 2019; Liu et al., 2021). This approach is particularly suitable for studying the psychological and emotional aspects of ideologies. Existing works often exhibit a parallel analysis of automated topic search in ideologically marked textual data and its submission to Sentiment Analysis, assisted by human discourse analysis and analytical interpretation of the results, with subsequent visualization in Cognitive-Affective Maps (CAMs) (Barna & Dugan, 2016; Homer-Dixon et al., 2013). Machine generated co-occurrence networks of emotional ideologemes produced by KH Coder 3 tools are also subsumed to further humanized discourse analysis via looking into the concordances to identify the nature of associations (see Pinich 2018a, 2018b).

The authors of the Cognitive-Affective Mapping (CAM) model emphasize the importance of human interpretation: *"...whatever the techniques, the activity of mapping should be built on attentiveness to the extensive literature on interpretation generated by work on ideology in the fields of intellectual history and discourse analysis"* (Homer-Dixon et al., 2013, p. 348). Consequently, translating the abstract concept of an ideology into measurable, observable components that can be systematically studied is complex due to the multifaceted nature of ideologies, which encompass a range of beliefs, values, emotional experiences, attitudes, and behaviors. Therefore, a well-balanced methodology is required, combining efficient machine-run quantitative analysis with careful human interpretation of the results.

The aim to operationalize ideology should follow a structured algorithm: 1) identifying key components and dimensions of ideology and outlining their observable indicators in the analyzed data; 2) deciding on the methodology toolkit, measurement mode, and choice of software; 3) developing the ordering and ratio for measurement and content analysis;

4) establishing procedures for data collection and processing; 5) validating measurements and ensuring the consistency of the results.

The subsequent sections provide an overview of issues related to corpus design and textual data processing in ideology analysis, assess the user-friendliness of KH Coder 3 for conducting quantitative content analysis procedures, and emphasize its benefits as toolkit software for blended-methodology approaches in analyzing Victorian ideology. This is followed by a recontextualization of key topics during a manual stage to ensure measurement consistency and the alternative computerized tools for ideology studies.

Corpus design in the study of ideology: representativeness, reliability, sustainability. Automatic text analysis, according to Van Atteveldt, Welders, and Van der Velden (2019), begins with obtaining textual data, which is then fed into computerized systems for transformation, measurement, and data structuring (see Figure 2).

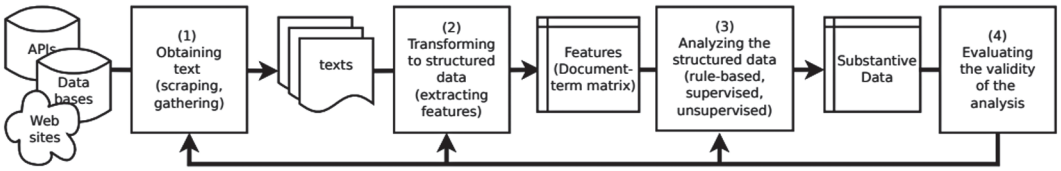

Fig. 2. **Procedure of Automatic Analysis of Textual Data**
Source: retrieved from Van Atteveldt et al., 2019

Data sourcing in ideology studies. Data collection follows two major patterns: 1) obtaining an off-the-shelf dataset or corpus for further feature extraction and automatic analysis (Aksenov et al., 2021; Bayram et al., 2019). In this case, terms of access and copyright issues must be considered to ensure the consistency of the research. Further data manipulations can range from leaving the data unchanged to organizing subsets of the data. 2) collecting the data that can include different sorts of texts (news, press releases, social media, legislation documents, etc.) (see Jin & Mihalcea, 2023) obtained automatically via "web-scrapers" or Application Programming Interface (API) (Van Atteveldt et al., 2019) or via an agile method of crowdsourcing for producing political data (see Benoit et al., 2016).

The fluidity and typological variety of textual data in NLP differ from the more paced and human-interpretable textual data used in corpus analysis. The former deals with dynamic, unstructured data suitable for machine learning algorithms, while the latter involves structured, stable datasets designed for in-depth human interpretation. Corpus analysis traditionally involves carefully curated and structured textual datasets. These corpora are designed to be representative of specific language use contexts and are often annotated for various linguistic features.

Constructing a corpus is an effort- and time-consuming endeavor shaped by the scope of research tasks and governed by the operating principles of the researcher's non-interference with the existing data and subsequent directed attention to the frequency of "repeated events" (Stubbs, 2004, p. 111). The organizational principles of corpus design include representativity, reliability, and suitability for both qualitative and quantitative machine-based data analysis, which distinguishes a corpus from a mere electronic library (Hunston, 2002, p. 2).

Corpora can be categorized based on the type of text transformations: raw (strings of orthographic word-forms), lemmatized, and annotated or tagged (for intonation, grammatical or semantic categories, and parts of speech) (Stubbs, 2004, p. 114). Additionally, corpora

can be classified according to research purposes: general, specialized, comparable, parallel, learners', pedagogic, historical or diachronic, and monitor corpora (ibid., p. 14–16).

General (or reference) corpora, such as the British National Corpus and The Brown Corpus, are usually well-balanced, voluminous in size, and can be used across various fields of research or referenced for baseline linguistic research. In contrast, specialized corpora are governed by parameters defined by the researcher, reflect anticipated research goals, and can be purposefully limited by the type of textual data collected, timespan of the data, subject field, demographics, and geographical origin of authors. These features form the basis for the representativeness of the corpora.

The Corpus of Late Modern English Texts for Victorian Ideology analysis. For the analysis of Victorian ideology, the Corpus of Late Modern English Texts (CLMET 3.1) was selected, generously provided by its authors, De Smet, Flach, Tyrkkö, and Diller (2015). The corpus was originally created to address a gap in existing corpora related to the history of English (De Smet, 2005). Its specific purpose was to bridge the period between the Helsinki Corpus, which ends with texts from 1710, and present-day English corpora. Other corpora that cover the period from 1710 to 1920 either extend into present-day English (The Archer Corpus (Biber et al., 1994)) or represent the transition from Early to Late Modern English, like the Lampeter Corpus (Siemund & Claridge, 1997).

The sustainability of the CLMET is ensured through careful design, maintenance, accessibility, and adaptability, making it reliable and relevant for ongoing and future research. The electronic texts were initially sourced from open online repositories such as Project Gutenberg and the Oxford Text Archive. Maintenance and updates continued until 2015, when the corpus received improved tokenization and annotation (De Smet et al., 2015).

Comprehensive documentation of the corpus construction process, including criteria for text selection, annotation guidelines, and preprocessing steps, is provided in the CLMET 3.1 manual. Detailed metadata about the texts is organized in an Excel grid (see Figure 3). This metadata includes periodization (quarter-century and decade), authorship, year of the author's birth, gender, title of the text, year of publication, genre, subgenre, source and date of download, notes on the content, and additional comments on the structure. This helps users understand the context and provenance of the data.

The user-friendly interface and downloadable format of the corpus enhance its accessibility and availability, while its technical infrastructure ensures compatibility with various linguistic tools and software, enabling integration with different analysis platforms.

	FILE	PERIOD	QUARTCENT	DECADE	YEAR	GENRE	SUBGENRE	TITLE	AUTHOR	GENDER	AUTHOR_BIRT	NOTES	SOURCE	DOWNLOADE
1	CLMET3_1_1_1.b	1710-1780	1700-1724	1710s	1710	Treatise	treat	A treatise concerning the principles (	Berkeley, George	M	1685		http://ota.ahds.a	25.09.2012
2	CLMET3_1_1_2.b	1710-1780	1700-1724	1710s	1717	Drama	drama	Three hours after marriage	Gay, John	M	1685		http://www.gutei	25.09.2012
3	CLMET3_1_1_3.b	1710-1780	1725-1749	1720s	1728	Drama	drama	The beggar's opera	Gay, John	M	1685	ballad opera	http://www.gutei	25.09.2012
4	CLMET3_1_1_4.b	1710-1780	1725-1749	1730s	1735	Treatise	treat	A defence of free-thinking in mathem	Berkeley, George	M	1685		http://ota.ahds.a	25.09.2012
5	CLMET3_1_1_5.b	1710-1780	1725-1749	1730s	1732	Other	x	The country housewife and ladyis dir	Bradley, Richard	M	1688	instructive writir	http://www.gutei	25.09.2012
6	CLMET3_1_1_6.b	1710-1780	1725-1749	1730s	1733-34	Other	x	An essay on man	Pope, Alexander	M	1688	Philosophical pc	http://www.gutei	25.09.2012
7	CLMET3_1_1_7.b	1710-1780	1725-1749	1740s	1740	Narrative fiction	fict	Pamela	Richardson, Sam	M	1689	Epistolary novel	http://www.gutei	25.09.2012
8	CLMET3_1_1_8.b	1710-1780	1725-1749	1740s	1741	LET	let	Letters written to and for particular f	Richardson, Sam	M	1689	Exemplary letter	http://ota.ahds.a	25.09.2012
9	CLMET3_1_1_9.b	1710-1780	1725-1749	1740s	1748	Narrative fiction	fict	Clarissa	Richardson, Sam	M	1689	Epistolary novel	http://www.gutei	25.09.2012

Fig. 3. **A sample of CLMET 3.1 metainformation**

The principled organization of the corpus ensures its representativeness and reliability for the ideological analysis of the Victorian era. The textual data in CLMET 3.1 is divided into three symmetrical sub-periods of 70 years each: 1710–1780, 1780–1850, and 1850–1920. However, only the last two sub-periods are the focus of the sub-corpus for studying Victorian ideology.

This generation-like fragmentation of the corpus captures historically homogeneous periods, demarcating the ideology's continuity. It encompasses the ideology's emergence

in the pre-Victorian period, characterized by the schematization of Victorian values and beliefs that formed the core concepts of the ideology. This period was driven by a tendency for general emotional suppression and conformity to moral rules. During the reign of Queen Victoria, the ideology solidified, marked by the entrenchment of its cognitive model, the rise of national pride, civil duty, and security. In the post-Victorian era, the ideology experienced a decline characterized by crises, reevaluation of core ideologemes, and an increase in anxiety and aggression.

Additionally, all the authors of the textual data are British and native speakers of English, inherently connected to the culture and witnesses to the lifespan of Victorian ideology. They are insiders of affective communities of their respective time periods, having been born into them and having written within that period.

To ensure diversity and avoid bias, each author's contribution is limited to 200,000 words, regardless of their influence in reflecting, reproducing, or spreading the conceptual framing of Victorian values and beliefs at any stage of their existence.

Lastly, while the corpus authors attempted to balance discourse registers (low and high) and the demographics of the writers, there remains an obvious bias towards authorship from higher-class male adults. This tendency is consistent with the social hierarchy and gender roles of the Victorian era.

A specific choice was made to focus on fictional texts within the sub-corpus for ideological analysis. Fictional texts arguably serve as a subtle and genuine reflection of ideology (Eagleton, 2003, p.169), capturing the true affiliations of individuals from the pre- to post-Victorian era. Unlike polemic or overtly biased political texts, fictional works are less likely to deliberately stir ideological sentiments or agitate for or against the dominant system of beliefs, they serve as imprints of ideological evolution.

Methods in corpus and big data analysis for the study of ideology. Ideological analysis involves "the investigation of embedded values, beliefs, biases, and assumptions within a specific text, in some domain of discourse, or in social practices within a particular cultural context, and of the motivations and power relations underlying these" (Chandler & Munday, 2011, p. 198), utilizing a variety of recognized methodological tools (see Figure 4).

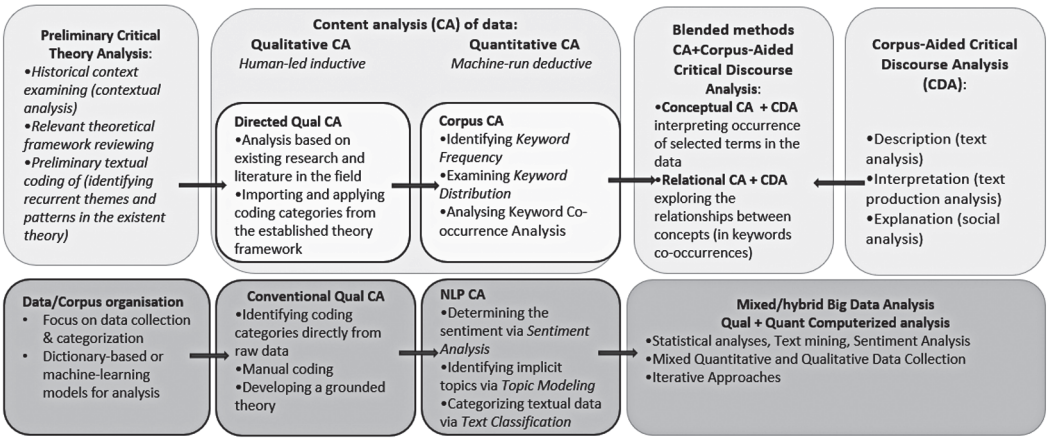

Fig. 4. **A toolkit of methods for computerized ideological analysis**
Source: Source: Own processing (Pinich, 2024)

The prevalence of content analysis and Critical Discourse Analysis (CDA) methodologies in studying ideology within textual data corpora (Lipinski, 2017; Liu et al., 2021) stems from

a well-established theoretical tradition. This tradition aims to identify key concepts, themes, and patterns (coding categories) of specific belief systems and interpretatively connect them to existing parties, groups, communities, or institutions that maintain power dynamics in society. The interpretative and explanatory aspects of the analysis are predominant, while automated tools play a supportive role, as visualized in the upper part of Figure 4. A focus on the validity of quantitative metrics alone results in hybrid or mixed data analysis with the computerized discourse analysis, which is displayed in the lower part of the figure.

Critical Discourse Analysis embraces three levels of discourse existence, inviting a tripartite perspective on its production that secures power hierarchies. The following algorithm is suggested: 1) at a microscopic level, a set of linguistic and rhetorical means are identified for outlining dominant communicative and rhetorical strategies; 2) at a meso-level, an interpretation of text production and processing is conducted; and 3) at a macroscopic level, an explanation or social analysis of salient social, historical, and cultural contexts is provided (Jimenez-Silva et al., 2016). The degree of automation in the analysis determines the sequencing of the procedure. A corpus-aided discourse analysis involves a preliminary or parallel overview of situational contexts and topics, including political and moral messages, to verify the accuracy of quantitative results of content analysis.

The choice of content analysis (CA) type is predetermined by research tasks, principles, and modes of interpretation. Generally, the ratio of interpretative and numerical findings within the content analysis methodology defines quantitative (machine-run) and qualitative (human-made) analyses.

A qualitative analysis of content is inductive, grounding the examination of topics and themes and the inferences drawn from them in the data (Zhang & Wildemuth, 2005). This approach uses discourse analysis of a larger context, taking into account social, cultural, and historical nuances, as well as subtle meanings within the text. The goal of qualitative analysis is to develop a grounded theory (conventional CA) or extend the conceptual framework through inductive analysis of the data in the directed CA.

In contrast, quantitative analysis of content is deductive, aimed at testing a hypothesis based on existing theories and previous empirical research. Quantitative content analysis employs random sampling of the data or other probabilistic approaches to ensure the validity of statistical inference. Corpus analysts employ technical corpus linguistic tools that help highlighting relevant linguistic features deserving for an in-depth analysis. There are three major ways for quantitative data processing in corpora: frequency of words, concordance of phrases and co-occurrence of keywords (Hunston, 2002, p. 3).

Words in corpora can be arranged in order of their frequency, revealing the dominant topics and themes in the textual data. Concordance lines allow the observation of regularities in the use of words and phrases, while the calculation of collocations exhibits the statistical tendencies of keywords to co-occur, forming a tentative network of ideologically significant ideas.

Corpus studies rely on both approaches when "qualitative analysis deals with the forms and antecedent-consequent patterns of form, while quantitative analysis deals with duration and frequency of form" (Smith, 1975, p. 218). These two ways of analysis are integrated in the two-level study of ideology and become blended in modern research to facilitate efficient and objective data processing.

Two-level analysis of ideological content and ideological practices. While corpus linguistics helps to support the critique of ideology with quantitative evidence regarding the propositional organization of ideologies, there is a need for methodological triangulation in ideology studies by consistently addressing the discursive practices that convey covert polemic. Incorporating qualitative discourse analysis proves beneficial for human-led analysis, both at the preliminary and conclusive stages of a corpus-assisted ideological

study. This approach results in an in-depth analysis, balancing corpus-based attestations of key ideological topics with interpretative and explanatory procedures that uncover the context of formative practices not visible to automated analysis.

The entry-level ideological analysis of theoretical sources involves establishing a discursive focus on the thematic dominance within ideologies as identified in the scientific tradition. Concurrently, computationally extracted ideological codes help develop or expand the theoretical framework at the "macroscopic level" (Liu et al., 2021). At this stage, semantic domains are identified through the frequency of keywords and co-occurrence networks. These domains are then analyzed within their immediate context using concordance lines to uncover the embedded ideologies and authorial stance. This microscopic level of in-depth analysis aims to reveal the tentative linkages between ideologically relevant concepts.

Machine-run content analysis for macroscopic analysis of textual data with KH Coder 3. At the macroscopic level, a quantitative content analysis using KH Coder 3 to identify key topics of Victorian ideology offers an array of user-friendly tools. The choice of co-occurrence networks was driven by the research goal of quantitatively establishing the linkage between lexemes representing moral emotion terms and tokens that presumably manifest distinct social articulations associated with specific social feelings. Following Stubbs' argument that repetitive co-occurrences reveal units of meaning in language (Stubbs, 2004, p. 108), the study adopts the presumption that these repetitive collocations provide empirical evidence for the interplay between language and cognition, manifesting ideological mechanisms for subconscious affiliation of the agents.

A standard procedure for KH Coder analysis follows this algorithm:

1. Pre-process a fictional text retrieved from CLMET 3.1.
2. Select a word-association tool, specify a direct coding term (emotion label), set a sentence-level type of data processing and run the analysis.
3. Filter results by parts of speech (POS) and frequency of co-occurrence to retain top 30 nouns for generating a visual map (see Figure 5).

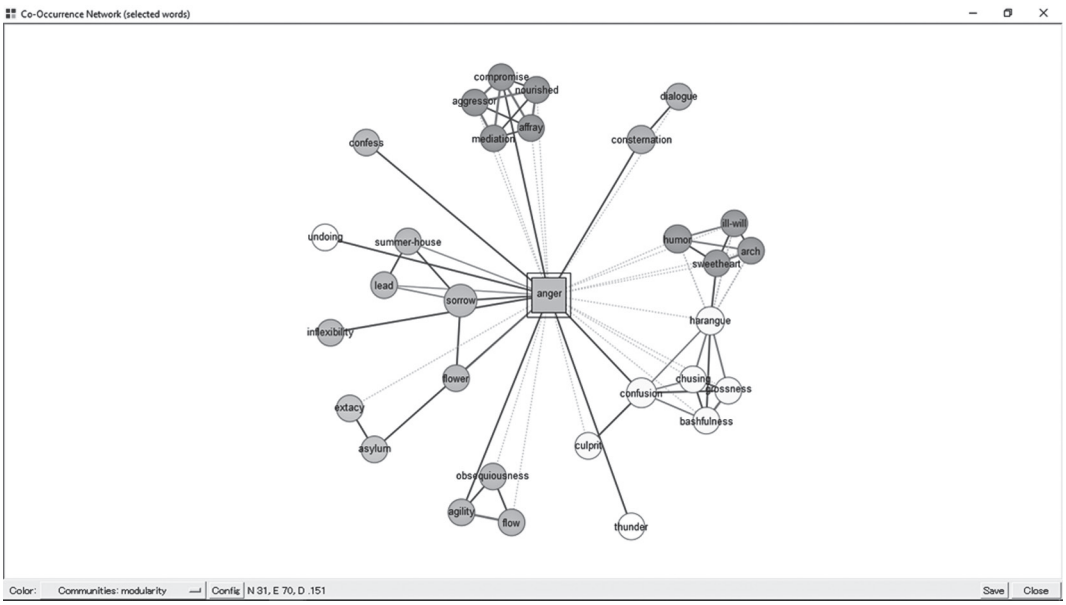

Fig. 5. **A sample of co-occurrence network chart generated with the help of KH Coder 3**

4. Configure co-occurrence networks by highlighting the minimum spanning tree, based on Prim's method, to feature the most significant edges.

5. Select the option for thicker lines to demonstrate stronger co-occurrences in the target file.

6. Set color coding to a scheme based on "communities" (sub-graphs) to represent clusters of the network that are more closely associated with each other through color coding.

Further extraction of meaning from the co-occurrence networks is achieved through a combination of quantitative and qualitative content analysis (See Krippendorff, 2004, pp. 87–89). The deductive reasoning design of the empirical research involves investigating term cohesion to observe the connectivity trends between moral emotions and the distinct spheres in which they circulate.

The term cohesion analysis aims to uncover the central role of axial emotional ideologemes in organizing and maintaining the coherence of radial ideologemes in Victorian ideology. These ideologemes are entrenched in the emotional folk models of the respective emotions, reflecting various aspects such as triggers of emotions, physical experiences, emotion regulation norms, manifestations of emotions, and measures for emotion sanctioning. To obtain trustworthy results, it is necessary to reference the context of the most frequently co-occurring terms displayed in the charts.

Concordance as a microscopic level analysis of textual data with KH Coder 3. Quantitatively identified significant edges in the network charts, organized into sub-graphs, promise valuable patterns that can be highlighted in their concordance lines. This perspective ensures the validation of metrics concerning the relevance of semantic domains in both sustaining and changing ideologies.

A discursive analysis of emotions contributing to ideological shifts involves testing through the re-contextualization of significant nodes using the Key Words in Context (KWIC) tool within KH Coder 3.

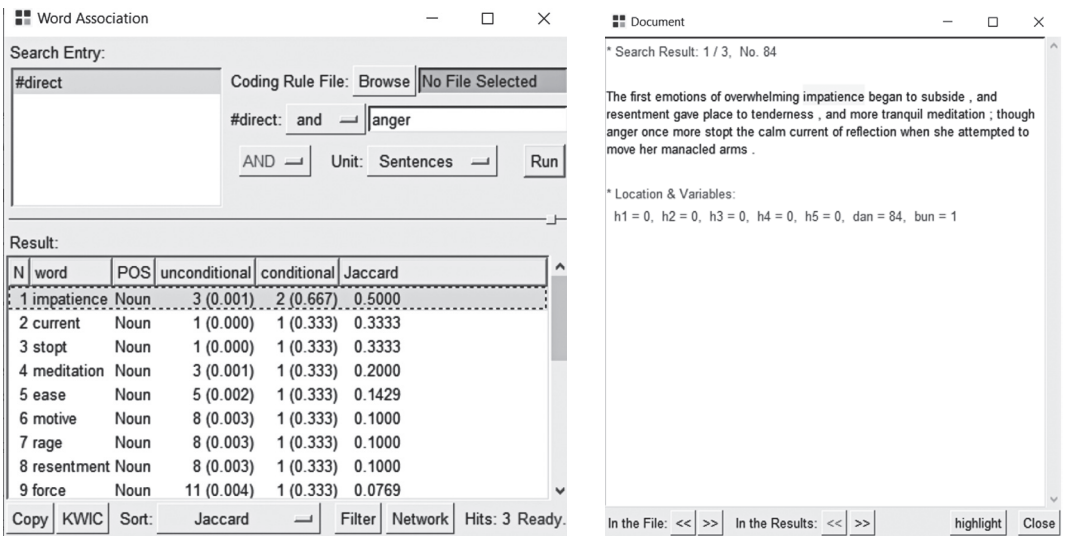

Fig. 6. **The interface of the KH Coder 3 Word Association tool (left) and a demonstration of KWIC Document extraction (right)**

On recontextualizing the most frequently co-occurring keywords, three aspects of qualitative analyses are undertaken:

1) Identifying the Specifics of Sub-Categories of Positive and Negative Moral Emotions. This analysis includes examining emotion elicitors, content of emotions, display patterns, action and motivation tendencies, and accountability. These sub-categories are manually extracted and closely analyzed to gain insights into conceptual shifts in emotion rules within the ideological life cycle of Victorian ideology.

For instance, a focused analysis of anger-eliciting factors in fictional texts from the late 18th to early 20th centuries (see Pinich, 2019a) reveals that pre-Victorian discourse highlighted social injustices or personal traits as triggers for anger. In contrast, Victorian times showed a dominance of secular anger elicitors, while post-Victorian novels reflect a return to socially relevant issues such as crime, fate, wealth, humiliation, interference, and meanness of tactics.

2) Establishing the Correlation Between Emotion Manifestation and Power Dynamics. This analysis involves fine-grained categorization of emotions while examining their historical and ideological modifications. For example, the acceptability of anger in pre-Victorian and Victorian fictional discourse reveals three recognized expressions related to power: 1) righteous divine and stern retributive anger associated with high social status, 2) intense uncontrolled anger that needs to be subdued as it disassociates from the normative behavior of subordinates, and 3) indecent clownish anger leading to social ostracism due to transgressing socially constructed manifestation rules. In post-Victorian novels, anger is associated with less restricted practices, and the overall fluctuation in co-occurrence dynamics indicates a general trend towards placating and restoring anger as a major ideological driver (ibid.).

3) Interpreting the Dynamics of Emotional Ideologemes within Ideological Conceptual Frames. This analysis involves mapping cognitive-emotive relationships between emotional and propositional concepts to trace ideological fervor and its tentative changes in the ideological lifecycle. For instance, the increasing linkage between ANGER and WAR & WARCRAFT in late Victorian and post-Victorian texts suggests a critical stage in Victorian moralist ideology. Additionally, the rise of guilt-culture in Victorian times is evidenced by the increased co-occurrence of GUILT with the categories of CRIME & PUNISHMENT and ECONOMY in Victorian novels, sharing the ideologemes of DUTY and JUSTICE (Pinich, 2018b). The legacy of religious roots in justice is also reflected in the co-occurrence analysis of JUSTICE with terms relevant to both RELIGION and CRIME & PUNISHMENT.

Triangulation strategy in quantitative/qualitative analysis: employing alternative corpora and tools for Victorian ideology studies. To test the validity of previous studies, a triangulation strategy was employed, incorporating methodological toolkit triangulation, and data source triangulation. To validate the findings on the fluctuating constructionist value of moral emotions in Victorian ideology, an additional study used an alternative specialized corpus: the British English corpus from Google's text corpora (Pinich, 2019c). This corpus was analyzed with the Google Ngram Viewer tool to investigate cognitive-emotional mappings in texts from the 1780s to the 1920s. The study examined the presence and dynamics of lexical representations of pertinent ideologemes in British texts from this historical period (see Figure 7).

A frequency analysis using the Google Ngram Viewer highlighted the heterogeneous processes of ideologemes' rises and declines while trends in the frequency graphs indicated the salience of relevant issues in the emerging ideological frames.

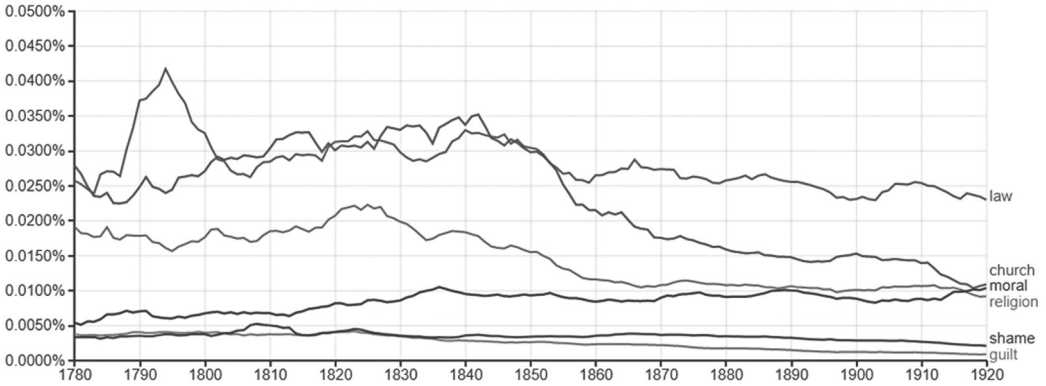

Fig. 7. **A sample of guilt/shame coding terms in British English corpus using Google Books Ngram Viewer**

The initial inventory of positive and negative moral ideologemes was expanded to include grey-zone moral reactions, such as envy, jealousy, resentment, and bitterness. A lexicographical analysis of contemporary dictionaries was also conducted to manually extract relevant coding terms for subsequent scrutiny of term co-occurrence in the fictional texts of the period.

The semantic category of RELIGION was found to encompass religious affectations, including respective institutions (church, temple, canonicals, clergy, ritual), doctrines (theology, revelation, Orthodoxy), acts (worship, idolatry, spell), and sentiments (piety, impiety, irreligion). Legal terms covered matters of power (authorities, judicial power, jurisdiction, legal power, power of legislating) and regulations (administration of justice, judiciary department, justice, statute, edict, regulation, decree, rights, law, customs). MORALITY was reflected in a coding category embracing ethics, moral principles, duty, virtue, character, and intention. Gender issues were represented by terms concerning biological sex, marital status (female, woman, lady, mistress, gentleman, husband, wife), origin (middle rank, above yeomanry, above vulgar, husband-knight, earl-farther, good family, good breeding), domestic affairs (domestic affairs, household), and behavior (gentle manners, refined manners). CRIME & PUNISHMENT was covered through terms organized around violations (law, human, divine, morality, public welfare), wrongdoings (violation, disobedience, murder, theft, crime, offense, misdemeanor, sin, vice, wrong), perpetrators (offender, criminal), legal actions (enforcement, law, accuse, charge, fault, legal action, guilty, verdict), and legal consequences (suffering, pain, loss, calamity). Financial issues were reflected in terms encompassing money management (expenses, waste, loss, frugality, prudence, savings, domestic affairs, household matters), financial policy (corporation, economy, state, system, rules, regulations, distribution, resources, Jewish economy, political), money matters (income, revenue, financial operations, public revenues, public money, funds), and capital management (treasurer, financier, economist, ruler, receiver, farmer).

The selection of the relevant propositional ideologemes was substantiated by their relation to actual ideological frames, identified in previous studies, and grouped around themes including RELIGION, ECONOMY, MONEY & FINANCE, POLICY & LAWMAKING, CRIME & PUNISHMENT, SOCIAL STATUS, GENDER, MORALITY & PRECEPTS, FAMILY & HOME, and WAR & WARFARE. The co-occurrence of their lexical representations with moral emotion labels indicated their interconnectedness and

suggested their further co-placement in Ngram Viewer searches, providing a basis for a research iterative model.

Conclusions. The longstanding traditions of critical literature analysis, discourse analysis, and hermeneutics have left a rich legacy for categorizing knowledge about the organization and evolution of ideology. This legacy has greatly benefited ideology operationalization and modern computer-assisted analysis of political and ideologically laden texts. The emergence of Natural Language Processing (NLP) research in this field has provided a compelling new methodological foundation for analyzing ideology. This trend emphasizes quantitative metrics derived from text mining and opinion mining techniques to label and define ideological affiliations within texts and their authors.

However, the role of the researcher remains crucial in directing content analysis and utilizing corpus-assisted discourse analysis in ideology critique. This approach supports the development of human-interpretable algorithms for ideological analysis, including outlining observable indicators, choosing optimal methodologies, developing ratios for qualitative and quantitative analyses, establishing data collection procedures, and ensuring consistency of results. Simultaneously, it drives advancements in data extraction and processing through iterative hybridization in ideological research.

Advocating for a blended methodology, which integrates machine-assisted statistical analysis of key term co-occurrences in fictional texts retrieved from corpora, the case study of Victorian ideology analysis suggests a two-level approach to corpus-based ideological research. At the macro-level, the analysis involves examining the cognitive-emotional organization of ideology by studying quantitative data in co-occurrence networks or word frequencies. This analysis is subsequently scrutinized at the microscopic level to contextually restore keywords.

An in-depth interpretative analysis allows for a comprehensive understanding of how attitudes toward critical social and political issues develop within the life cycle of ideology, and how propositional aspects of ideology are integrated with the dominant emotion models in affective societies.

Objectifying results involves triangulating methodologies, sources, and researchers to validate or challenge initial hypotheses securely.

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