

A QUANTITATIVE ANALYSIS OF RESEARCH TRENDS AND THEMATIC DEVELOPMENT IN DERIVATIONAL MORPHOLOGY

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Derivational morphology; Quantitative analysis; Research trends; Thematic development; Scientometrics;	<p><i>Derivational morphology is crucial for understanding the organization of language and dynamics of vocabulary expansion. Despite extensive research in this area, a data-driven analysis of research trends and thematic development has been lacking. This study aims to address this gap by employing a scientometric approach to analyze publications on derivational morphology from 2014 to 2024. Utilizing the Scopus database, a corpus of 370 English-language publications was compiled and analyzed using VOSviewer software. The findings reveal a steady growth in yearly output, with an average of 34 publications per year. Network visualization of keyword co-occurrence identified five prominent thematic clusters: (1) core morphological concepts (22.78%), (2) morphology-semantics interface (20.14%), (3) morphology-syntax interface (19.44%), (4) psycholinguistic perspectives (18.06%), and (5) cognitive aspects of word recognition (14.58%). Collectively, these cluster illuminate the evolving landscape of derivational morphology research, highlighting key areas for future investigation, particularly at the interfaces with semantics, syntax, and cognition. The study's findings therefore offer guidance for shaping future research trajectories and developing comprehensive morphology curricula that reflect the field's nature.</i></p>

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INTRODUCTION

Language is characterized by its intricate system of rules governing the formation of words and their meanings. Morphology, the branch of linguistics dedicated to the study of word structure, plays a crucial role in understanding how morphemes, the smallest meaning-bearing units, combine to create complex words (Körtvélyessy & Štekauer, 2020). Derivational morphology, in particular, focuses on the processes that create new words by adding affixes (prefixes, suffixes, infixes) to existing roots or stems, often altering the word's meaning or grammatical category (Lieber, 2017). Beyond affixation, derivational morphology also encompasses processes such as compounding, where two or more existing words are combined to form a new word (Hüning & Booij, 2014), and conversion, where a word changes its grammatical category without change in form (Lieber & Plag, 2022). Furthermore, processes like blending, which merges parts of two or more words (Fradin, 2015), and clipping, which shortens existing words (Steinhauer, 2015), contribute to the dynamic expansion of a language's lexicon. Additionally, back-formation, the creation of a new word by removing an apparent affix from an existing one (Štekauer, 2015), highlights the complex interplay between morphology and historical change. This dynamic process of word formation allows languages to adapt and evolve, enriching their lexicons and enabling speakers to express a wide range of concepts. The study of derivational morphology is thus essential for understanding the organization of mental lexicons, the relationship between form and meaning.

Derivational morphology is grounded in theoretical frameworks that seek to explain the relationship between form, meaning, and syntactic function in word formation. Rooted in structuralist traditions, early work emphasized the morpheme as the fundamental unit of morphological analysis, exploring its role in constructing complex words (e.g., Booij, 2016). Generative approaches, on the other hand, focus on the rules and processes that govern word formation, often employing formal mechanisms to capture the productivity and creativity of derivational morphology (e.g., Pustejovsky, 2020). Cognitive linguistics perspectives highlight the role of conceptual metaphors and cognitive processes in shaping derivational patterns, emphasizing the link between morphology and semantic networks (e.g., Amenta et al., 2020). More recently, research has explored the interaction between morphology and other linguistic domains such as phonology, syntax, and semantics, leading to interdisciplinary approaches that integrate insights from various subfields (e.g., Aronoff, 2018). The study of derivational morphology has also benefited from typological perspectives, which examine cross-linguistic variations in word formation strategies and their implications for universal principles of grammar (e.g., Luschützky, 2015). These diverse theoretical foundations provide a solid framework for investigating the nature of derivational morphology.

Furthermore, previous research on derivational morphology has explored a wide range of topics, including the semantic properties of derivational affixes (e.g., Liceras & Klassen, 2019; Nugraha, 2021, 2024a, 2024b), the productivity and frequency of derivational processes (e.g., Copot et al., 2022; Kleineberg, 2023), the acquisition of derivational morphology in first and second language learners (e.g., Stephany, 2021), and the role of derivational morphology in language change (e.g., Caha et al., 2023; van Klinken & Hajek, 2020). Computational approaches have also gained prominence, with researchers employing corpus linguistics and natural language processing techniques to analyze large datasets of morphological data (e.g., Haley et al., 2024; Morita, 2024). While these studies have provided insights into various aspects of derivational morphology, data-driven quantitative analysis of research trends and thematic development within the field has been lacking. The present study addresses this gap by employing a scientometric approach to analyze a large corpus of publications on derivational morphology from 2014 to 2024. In particular, the present study aims to provide a quantitative analysis of research trends and thematic development in derivational morphology over the past decade. By employing a scientometric approach, we seek to map the intellectual landscape of the field based on the following two research questions:

- 1) What are the research trends and their progress in derivational morphology (2014-2024)?
- 2) What are the prominent thematic clusters and their relationships in derivational morphology research (2014-2024), identified by co-occurrence analysis?

METHOD

Research Design

This study adopts a scientometric approach to quantitatively analyze research trends and thematic progress in derivational morphology (2014-2024). Scientometrics, the quantitative study of science and scientific communication (Hood & Wilson, 2001; Sooryamoorthy, 2020), provides a framework for investigating the evolution of research fields through the analysis of publication data. This approach allows for the identification of key trends, influential authors, prominent research institutions, and emerging themes within a specific domain (Waltman & van Eck, 2019). Specifically, this study utilizes network analysis techniques to visualize and interpret the intellectual structure of derivational morphology research. Network analysis is particularly well-suited for exploring relationships between different elements within a dataset, such as co-occurring keywords in publications. This method enables the identification of clusters of related terms, revealing underlying thematic areas and the connections between them. The visualization of these networks provides a comprehensive and intuitive

representation of the intellectual landscape of the field. VOSviewer (1.6.20), a software tool specifically designed for creating and visualizing bibliometric networks (van Eck & Waltman, 2010, 2023), was employed for this purpose.

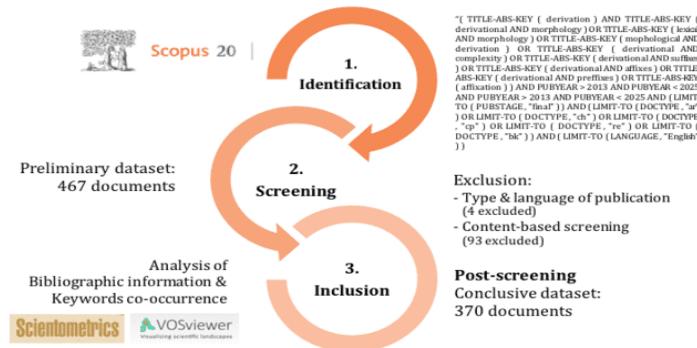


Figure 1. Series of exploration activities in the present study.

Materials

The data for this study was retrieved from the Scopus database. Scopus was chosen for its extensive coverage of scholarly publications across various disciplines, including linguistics. The search query was designed to capture all relevant publications related to derivational morphology within the specified timeframe (2014-2024). The query, as exemplified in (1), included a combination of keywords related to derivational morphology, such as "derivation," "derivational morphology," "lexical morphology," "morphological derivation," "derivational complexity," "derivational suffixes," "derivational affixes," "derivational prefixes," and "affixation." The search was limited to publications between 2014 and 2024 (inclusive), and to document types including articles, book chapters, conference papers, reviews, and books. The initial search yielded 467 documents. After a refinement process, which involved removing duplicates and language-use (only written in English is acceptable), the dataset was reduced to 463 documents. Finally, the dataset was further refined to include relevant only publications based on title and abstract screening, resulting in a final corpus of 370 documents. This final corpus formed the basis for the subsequent analysis.

(1) Extract of query:

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("TITLE-ABS-KEY ( derivation ) AND TITLE-ABS-KEY ( derivational AND morphology ) OR TITLE-ABS-KEY ( lexical AND morphology ) OR TITLE-ABS-KEY ( morphological AND derivation ) OR TITLE-ABS-KEY ( derivational AND complexity ) OR TITLE-ABS-KEY ( derivational AND suffixes ) OR TITLE-ABS-KEY ( derivational AND affixes ) OR TITLE-ABS-KEY ( derivational AND prefixes ) OR TITLE-ABS-KEY ( affixation ) ) AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND LIMIT-TO ( PUBSTAGE , "final" ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "ch" ) OR LIMIT-TO ( DOCTYPE , "cp" ) OR LIMIT-TO ( DOCTYPE , "re" ) OR LIMIT-TO ( DOCTYPE , "bk" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) )."

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Data Analysis

The data analysis for this study consisted of two main components: a bibliographic-based analysis and a co-occurrence of terms analysis. The bibliographic-based analysis involved examining publication trends over time, identifying prominent publications sources, contributing authors, affiliated institutions, funding sponsors, and the distribution of publications across different subject areas. This analysis provides a quantitative overview of the research landscape in derivational morphology, specifically within 2014 and 2024. The co-occurrence of terms analysis was performed using VOSviewer to identify and visualize clusters of related keywords. A map was created based on bibliographic data, specifically focusing on keyword co-occurrence. The type of analysis was set to "co-occurrence," and the unit of

analysis was “all keywords.” “Full counting” was used as the counting method. A minimum occurrence threshold of 3 was set for keywords to be included in the analysis. Out of the initial 1,438 keywords, 158 met this threshold. After a second refinement, involving manual inspection and grouping of related keywords, the final set of keywords for the network visualization was 144. For each of these 144 keywords, VOSviewer calculated the total strength of co-occurrence links with other keywords algorithmically. The keywords with the greatest total link strength, which in this case included all 144 keywords, were selected for the network visualization.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

This section presents the results of a quantitative analysis based on a dataset of 370 publications retrieved from the Scopus database. We begin by examining the chronological output of publications, followed by an overview of influential publishing publisher and leading scholars in the field. Then, we analyze the institutional distribution of research, the geographical distribution of papers by nations, and their funding sponsors. Finally, we delve into the thematic clustering through keyword co-occurrence analysis, visualizing the distribution and identifying thematic clusters that have shaped the field’s intellectual landscape over the past decade.

Yearly Publication

Spanning the period from 2014 to 2024, Figure 2(a) illustrates the yearly distribution of publication related to derivational morphology within the analyzed dataset. A cursory glance reveals a fluctuating trend in scholarly output over these eleven years. The year 2016 stands out with the highest number of publications (51, representing 13.8% of the total), more than double output of the preceding year (23 publications in 2015, 6.2%). Conversely, 2015 and 2014 exhibit comparatively lower publication counts, with 23 (6.2%) and 24 (6.5%) documents respectively. While 2017 saw a decrease to 27 publications (7.3%), the subsequent years witnessed a gradual climb, albeit with minor oscillations. The period from 2018 to 2024 demonstrates a more consistent, though not uniformly increasing, pattern with yearly publication numbers ranging 31 to 41. Notably, 2023 recorded 38 publications (10.3%), indicating a renewed interest in the field. The overall trend suggests a period of significant growth in research output between 2015 and 2016, followed by a phase of relative stabilization with ongoing scholarly contribution in the subsequent years.

To provide more detailed understanding of the publication trend, we can consider the data in terms of growth patterns. While a direct year-on-year growth rate calculation reveals substantial volatility, particularly with the significant jump in 2016, an overall assessment of growth can be ascertained. Considering the total publications from 2014 to 2017 (125 publications, 33.8%) as a base line, and comparing it to the total from 2018 to 2024 (245 publications, 66.2%), demonstrates a clear increase in scholarly output in the latter period. This suggests a positive growth trajectory in the field of derivational morphology research over the eleven-year period. The average yearly publication quantity is approximately 33.6 (rounded into 34), with the years 2016 and the period from 2018 to 2024 exceeding this average. Despite fluctuations and a lack of consistent year-on-year growth, the data point towards a growing scholarly interest in derivational morphology. The total percentage of publication from 2018 and 2024 represents 66.2% of the entire dataset, further underscoring the increasing research activity in the latter half of examined timeframe.

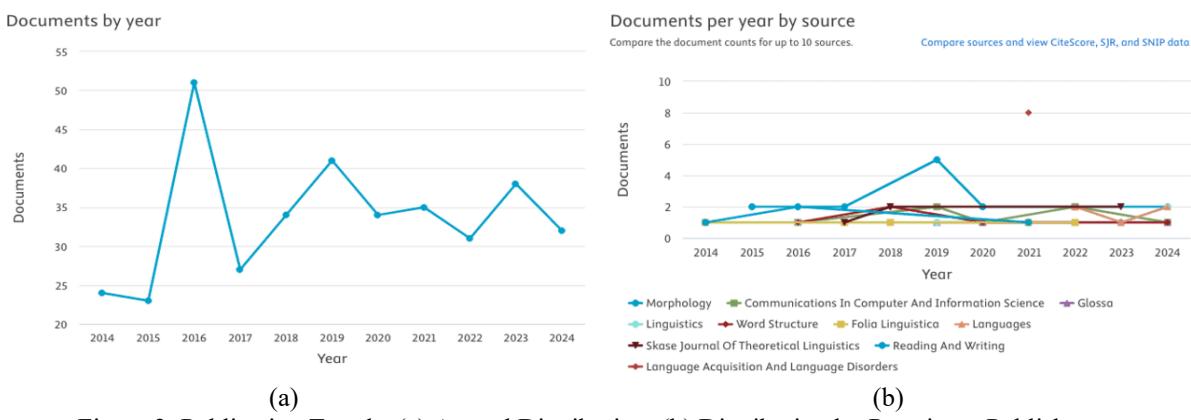


Figure 2. Publication Trends: (a) Annual Distribution; (b) Distribution by Prominent Publisher.

The Prominent Publisher

Offering insights into the dissemination channels favored by researchers in derivational morphology, Figure 2(b) presents the distribution of publication across prominent publishing sources. The figure lists the top ten sources, ranked by the number of published documents within the analyzed corpus. *Morphology*, a specialized journal in the field, leads with 15 publications, representing 4.05% of the total corpus. This suggests that *Morphology* serves as a key venue for research specifically focused on morphological phenomena. Following this, *Language Acquisition and Language Disorders* contributes 8 publications (2.16%), indicating a connection between derivational morphology and the study of language acquisition and its potential impairments. *Communications in Computer and Information Science* appears as the third most prominent source with 7 publications (1.89%), highlighting the growing interdisciplinary nature of morphological research, potentially at the intersection of computational linguistics and morphology. Several sources, including *Glossa*, *Linguistics*, and *Word Structure*, each contribute 6 publications (1.62%).

The remaining prominent publishers, *Folia Linguistica*, *Language*, and *Skase Journal of Theoretical Linguistics*, each account for 5 publications (1.35%), while *Reading and Writing* registers 4 publications (1.08%). Collectively these ten sources account for 67 publications, representing 18.1% of the total corpus of 370 publications. While this indicates a concentration of research within these key venues, it also suggests a relatively dispersed publication landscape, with the remaining 81.9% of publications spread across a wider range of journals, books, and conference proceedings. Notably, the top source, *Morphology*, accounts for more than double the publications of the second-ranked source, highlighting its relative prominence. The average percentage of publications for these top ten sources is 1.81%, with *Morphology* significantly exceeding this average, and *Reading and Writing* falling below. This disparity underscores the importance of *Morphology* as a central hub for derivational morphology research, while also demonstrating the field's presence and relevance within a diversity of linguistic and interdisciplinary publications. The relatively even distribution among several sources (e.g., *Glossa*, *Linguistics*, and *Word Structure*) suggests that the field engages with a broader readership within the linguistic community.

The Notable Authors

Highlighting the most prolific scholars in this research domain, Figure 3(a) showcases the distribution of publications by notable authors contributing to the research landscape of derivational morphology. The graph ranks authors based on their publication output within the analyzed corpus. Žabokrtský, Z. emerges as the most prominent author with 6 publications, constituting 1.62% of the total corpus. This singular contribution suggests a significant and sustained engagement with the field, positioning Žabokrtský, Z. as one of the key figures in derivational morphology research. Following this, Bonami, O. and Ševčíková, M. each register

5 publications, representing 1.35% of the total corpus, indicating substantial contributions to the field. A cluster of authors, including Hathout, N., Kazakovskaya, V.V., Kisselew, M., Namer, F., Padó, S., and Schütze, H., have each authored 4 publications, accounting for 1.08% of the corpus individually. This cohort of researchers demonstrates a consistent and noteworthy scholarly output, collectively contributing a significant body of work to the field.

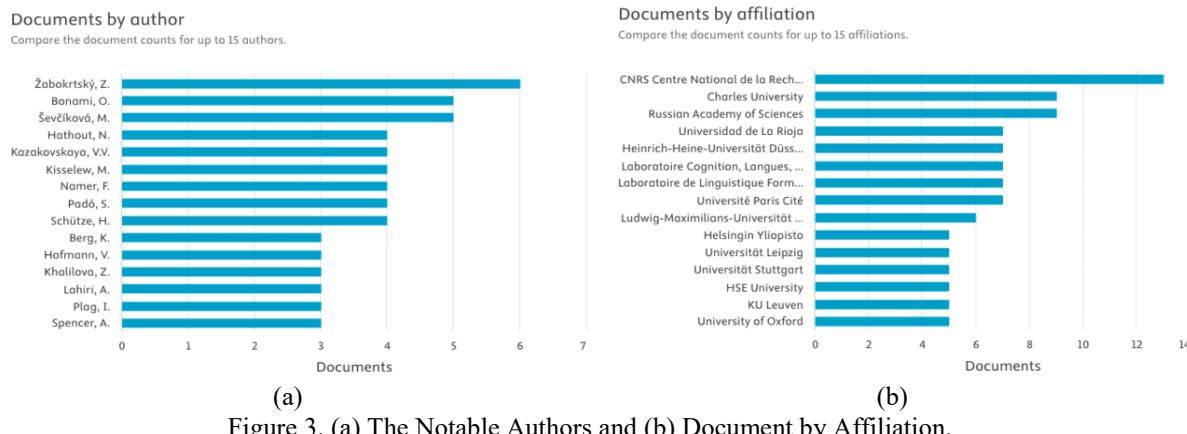


Figure 3. (a) The Notable Authors and (b) Document by Affiliation.

The subsequent tied or authors, comprising Berg, K., Hofmann, V., Khalilova, Z., Lahiri, A., Plag, I., and Spencer, A., have each published 3 documents, representing 0.81% of the total corpus. While their individual contributions are smaller compared to the leading authors, their collective output still forms a substantial portion of the research landscape. Cumulatively, the authors represented in Figure 3(a) have produced 62 publications, accounting for 16.76% of the entire corpus of 370 publications. This indicates that a significant portion of the research output is concentrated among these more prolific authors, though it also implies a wide contribution from a larger pool of researchers not represented in the top 15. The average contribution of these 15 authors is 1.12%, with Žabokrtský's output exceeding this average and the contributions of the remaining authors falling below it. This distribution pattern is characteristic of many scholarly fields, where a small number of highly productive researchers often contribute a disproportionately large share of the total output.

Documents by Affiliation

Revealing the research centers and universities contributing to the study of derivational morphology, Figure 3(b) illustrates the distribution of publications by institutional affiliation. The CNRS (Centre National de la Recherche Scientifique) leads with 13 publications, representing 3.51% of the total corpus, indicating a strong concentration of research activity within this French national research organization. Following this, Charles University and the Russian Academy of Sciences each account for 9 publications (2.43%), demonstrating significant contributions from research groups in Czech Republic and Russia, respectively. A cluster of institutions including Universidad de la Rioja, Heinrich-Heine-Universität Düsseldorf, Laboratoire Cognition, Langues, Langage, Ergonomie, Laboratoire de Linguistique Formelle, and Université Paris Cité, each contributed 7 publications (1.89%), suggesting a notable presence of derivational morphology research within these European universities and research centers. This concentration of institutions within Europe underscores the continent's prominent role in morphological research. The data highlights a diverse range of affiliations, suggesting that research in derivational morphology is not confined to a single institutional context.

Several other universities and research centers also made noteworthy contributions. Ludwig-Maximilians-Universität München contributed 6 publications (1.62%), while Heilsingin Yliopisto, Universität Leipzig, Universität Stuttgart, HSE University, KU Leuven, and the

University of Oxford each accounted for 5 publications (1.35%). Collectively, the institutions listed in Figure 3(b) represent a substantial portion of the research output in derivational morphology. These 15 institutions account for 98 publications, representing 26.49% of the total corpus. This indicates that while a core group of institutions are highly active in this area, a large proportion of research is still being conducted across a wider range of universities and research centers not represented in this top 15 list. The average contribution of these 15 institutions is 1.77%, with CNRS exceeding this average and the other institutions falling near or below it. This distribution reflects a typical pattern in academia, where a smaller number of institutions produce a larger share of the published research.

Documents by Country

Illustrating the global reach of research in derivational morphology, Figure 4(a) presents the geographical distribution of publications. Germany emerges as the most prolific country with 60 publications, representing 16.22% of the total corpus. This substantial contribution underscores Germany's leading role in morphological research. The United States follows with 46 publications (12.43%), demonstrating a significant presence in this field as well. France occupies the third position with 28 publications (7.57%), highlighting a strong tradition of linguistic scholarship in this country. The Russian Federation contributes 23 Publications (6.22%), indicating a growing interest in derivational morphology within this region. The United Kingdom and Spain account for 22 (5.95%) and 20 (5.41%) publications respectively, further demonstrating the widespread engagement with this area of linguistics across Europe. These leading countries collectively account for a significant portion of the global research output, highlighting their central role in advancing the field.

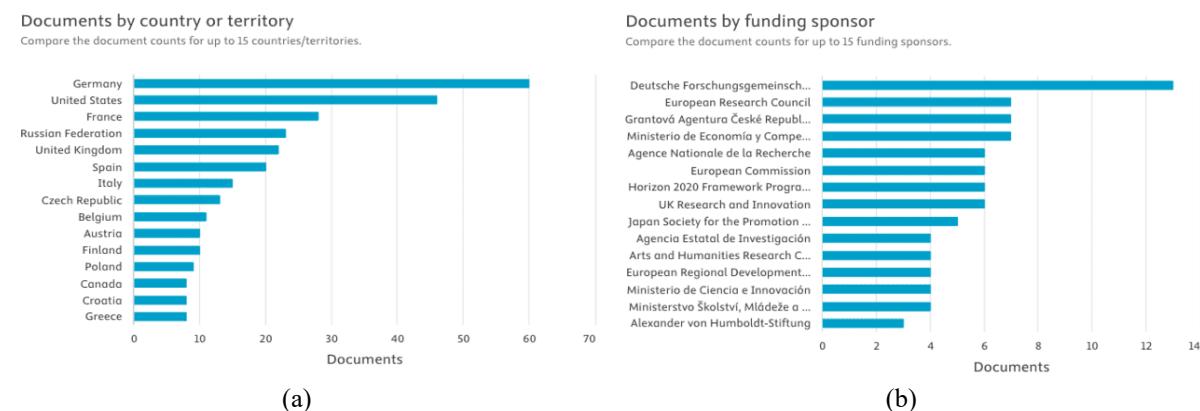


Figure 4. (a) Documents by Country and (b) Documents by Funding Sponsor.

Several other countries also contribute notably to the research landscape. Italy accounts for 15 publications (4.05%), while the Czech Republic registers 13 publications (3.51%). Belgium and Austria each contribute 11 (2.97%) and 10 (2.7%) publications, respectively, along with Finland which also has 10 publications (2.70%). Poland accounts for 9 publications (2.43%), while Canada, Croatia, and Greece each contribute 8 publications (2.16%). Collectively, the countries visualized in Figure 4(a) account for 261 publications, representing 70.54% of the entire corpus. This underscores the global nature of derivational morphology research, with contributions spanning across numerous countries and continents. The average contribution of these 15 countries is 4.70%, with Germany significantly exceeding this average, and several countries falling below. The distribution pattern is common in scientometric analyses, where a few key players often dominate the publication landscape. The data presented in Figure 4(a) provides empirical insight into the geographical distribution of research activity, highlighting the key centers of scholarship and potential avenues for international collaboration.

Documents by Funding Sponsor

Offering insights into the financial backing driving scholarly work in this field, Figure 4(b) presents the distribution of funding sponsors supporting research on derivational morphology. The Deutsche Forschungsgemeinschaft (DFG) emerges as the most prominent funding sponsor, with 13 publications (3.51% of the total corpus) acknowledging its support. This indicates the DFG's significant role in facilitating research on derivational morphology, particularly within the German academic landscape. Following this, a cluster of funding bodies, including the European Research Council, Grantová Agentura České Republik, and Ministerio de Economía y Competitividad, each account for 7 publications (1.89%). This suggests that these organizations play a crucial role in supporting research endeavors in this domain, both at the European and national levels. The Agence Nationale de La Recherche, European Commission, Horizon 2020 Framework Programme, and UK Research and Innovation each contributed to 6 publications (1.62%), demonstrating a continued trend of European and international funding agencies supporting research in derivational morphology.

Several other funding sponsors have also made noteworthy contributions. The Japan Society for the Promotion of Science accounts for 5 publications (1.35%), highlighting the global reach of funding initiatives in this field. Agencia Estatal de Investigación, Arts and Humanities Research Council, European Regional Development Fund, Ministerio de Ciencia e Innovación, and Ministerstvo Školství, Mládeže a Tělovýchovy each supported 4 publications (1.08%), while the Alexander von Humboldt-Stiftung contributed to 3 publications (0.81%). Collectively, the funding sponsors listed in Figure 4(b) have supported 81 publications, representing 21.89% of the total corpus. This data underscores the importance of external funding in facilitating research on derivational morphology, as a significant portion of publications acknowledge financial support. The average contribution of these 15 funding sponsors is 1.46%, with the DFG exceeding this average and the remaining sponsors falling below. This distribution pattern is typical in scientometric analyses, where a few key funding bodies often provide the majority of research grants.

Keyword Clustering for Thematic Development

Regarding the thematic development, Figure 5 offers a network visualization of the most frequently connected keywords. This visualization illuminates the intellectual landscape of the field by illustrating the relationships and co-occurrences of key terms. Five distinct clusters emerge, each represented by a different color and encompassing a specific set of interconnected keywords. The red cluster, the largest, comprises 40 keywords (27.78%), suggesting a strong focus on core morphological concepts and their interrelations. The green cluster, with 29 keywords (20.14%), highlights a significant area of research exploring the interface between morphology and other linguistic domains. The blue cluster, containing 28 keywords (19.44%), suggests a substantial body of work examining derivational morphology from a specific theoretical or methodological perspective. The yellow cluster, with 26 keywords (18.06%), points to a growing interest in the application of derivational morphology research to areas such as language acquisition or computational linguistics. Finally, the purple cluster, the smallest with 21 keywords (14.58%), indicates a distinct line of inquiry that may be more specialized or emergent within the field. In general, Figure 5 effectively visualizes the intellectual landscape of derivational morphology research, revealing the prominent themes, their interconnections, and the relative emphasis placed on each area within the scholarly discourse.

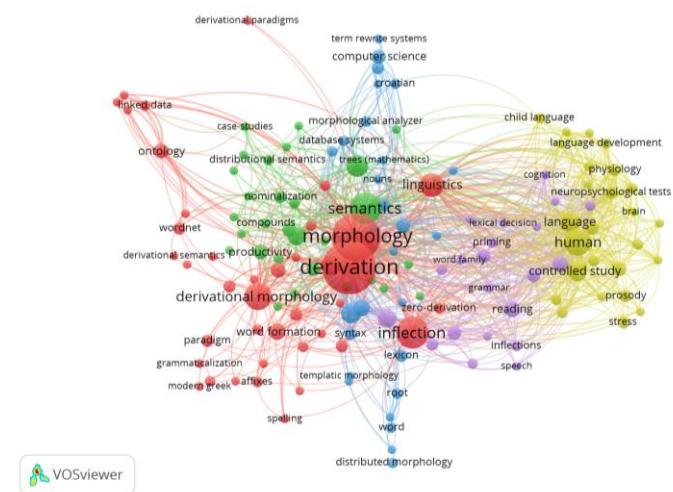


Figure 5. Network Visualization of the Most Connected Keywords.

In particular, Table 1 presents the detailed composition of Cluster 1, the largest cluster identified in the network visualization of keywords related to derivational morphology. This cluster reveals a strong focus on core morphological concepts and their intricate relationships. Within Cluster 1, several sub-clusters can be discerned. Sub-cluster (C.1-1) centers around the lexicon and its interface with morphology, featuring terms such as “lexical network” and “word formation.” This suggests a line of research investigating how derivational processes shape the mental lexicon and contribute to vocabulary enrichment. Another sub-cluster (C.1-2) focuses on the formal representation of morphological knowledge, including “morphological analysis” and “linked data.” This indicates an interest in leveraging computational tools and formal frameworks to model morphological structures and relationships. A third sub-cluster (C.1-3) revolves around specific languages and language families, as seen in the presence of “modern Greek” and “Old English.” This highlights research efforts dedicated to the study of derivational morphology within particular linguistic contexts. Finally, a sub-cluster (C.1-4) encompassing “corpus linguistics” and “wordnet” suggests the utilization of corpus-based methodologies and established linguistic resources in the investigation of derivational morphology. These semantically cohesive sub-clusters within Cluster 1 illustrate the nature of research in this area, revealing distinct yet interconnected lines of inquiry.

Furthermore, Table 1 details the composition of Cluster 2. This cluster exhibits a strong focus on the interface between morphology and semantics, syntax, and language processing. Within Cluster 2, several distinct sub-clusters can be identified. One prominent sub-cluster (C.2-1) centers around computational and quantitative approaches to derivational morphology, featuring terms such as “natural language processing” and “natural language processing systems.” This suggests a line of research leveraging computational tools and statistical methods to analyze and model derivational processes. Another sub-cluster (C.2-2) focuses on the semantic aspects of word formation, including “semantics” and “distributional semantics.” This indicates a strong interest in how meaning is encoded and manipulated in derivational morphology, as well as how derivational processes interact with semantic phenomena like metonymy. A third sub-cluster (C.2-3) revolves around language acquisition and contact, as evidenced by the inclusion of “language acquisition” and “language contact.” This highlights research efforts exploring how derivational morphology is acquired by language learners and how it is influenced by language contact. Finally, a sub-cluster (C.2-4) encompassing “productivity” and “lexical resources” suggests a methodological focus on in-depth investigations of specific phenomena, quantitative measures of morphological productivity, and the utilization of existing lexical databases and resources.

Table 1. The most visible thematic-cluster Based on co-occurrence of keywords.

Cl.	Quantity (%)	Color in Fig. 5	Item
1.	40 (27.78%)	Red	affixation; affixes; corpus linguistics; derivation; derivational morphology; derivational paradigms; derivational semantics; diminutives; grammaticalization; inflection; language change; lexical network; lexical networks; lexical semantics; lexicography; linguistic linked data; linguistics; linked data; modern Greek; morphological analysis; morphology; neologisms; old English; ontologies; ontology; ontology's; paradigm; paradigms; phonology; semantic derivation; semantic relation; Spanish; spelling; suffix; typology; verb classes; word formation; word-formation; wordnet; zero-derivation
2.	29 (20.14%)	Green	word formation; verb derivation; Turkish; semantics; semantic properties; Russian; regression analysis; quality control; productivity; prefixes; nominalization; natural language processing system; natural language processing; nanosyntax; morphological process; metonymy; linguistic information; lexical resources; language resources; language model; language contact; language acquisition; Italian; Estonian; distributional semantics; distributional models; computational linguistics; compound; case-studies
3.	28 (19.44%)	Blue	word; verbs; verbal derivation; trees; term rewrite systems; templatic morphology; syntax; syntactics; suspended affixation; stem; state of the art; root; nouns; morphological analyzer; lexicon; grammatical category; German; distributed morphology; diachrony; denominal verbs; database systems; Croatians; Croatian; conversion; computers; computer science; compounding; affix
4.	26 (18.06%)	Yellow	vocabulary; task performance; stress; stimulus response; reaction time; prosody; physiology; neuropsychological test; neuropsychological tests; morphological processing; magnetic resonance imaging; language tests; language test; language development; language ability; language; human experiment; human; electroencephalogram; controlled study; child language; brain mapping; brain; awareness
5.	21 (14.58%)	Purple	word recognition; word family; verb; speech; reading; priming; noun; morphological decomposition; morphological awareness; lexical decision; learning; language processing; inflections; Hebrew; grammar; frequency; English; derivations; construction morphology; comprehension; cognition

In addition to twofold above-mentioned clusters, Table 1 also presents the detailed composition of Cluster 3, the third largest cluster in the keyword network visualization. This cluster reveals a strong emphasis on the interplay between morphology and syntax, as well as a focus on specific morphological phenomena and languages. Within Cluster 3, several distinct sub-clusters can be identified. Sub-cluster (C.3-1) centers around the morphology-syntax interface, featuring terms such as "syntax," "syntactics," "grammatical category," "verbal derivation," and "nouns." This highlights a line of research investigating how derivational processes influence syntactic structure and how words are categorized into different grammatical classes. Another sub-cluster (C.3-2) focuses on the internal structure of words and specific morphological processes, including "stem," "root," "affix," "conversion," "compounding," and "templatic morphology." This suggests a research emphasis on the mechanisms of word formation, the identification of morphemes, and the analysis of specific morphological phenomena like conversion and compounding. A third sub-cluster (C.3-3) revolves around language-specific morphology, as evidenced by the inclusion of specific languages, e.g., "German" and "Croatian." This indicates research effort dedicated to the study of derivational morphology within these specific linguistic contexts, potentially exploring language-specific patterns and typological characteristics. Finally, a sub-cluster (C.3-4) encompassing "morphological analyzer," "lexicon," and "database systems" suggests the use of computational tools and resources in morphological research, particularly for tasks such as morphological analysis and the creation of lexical databases.

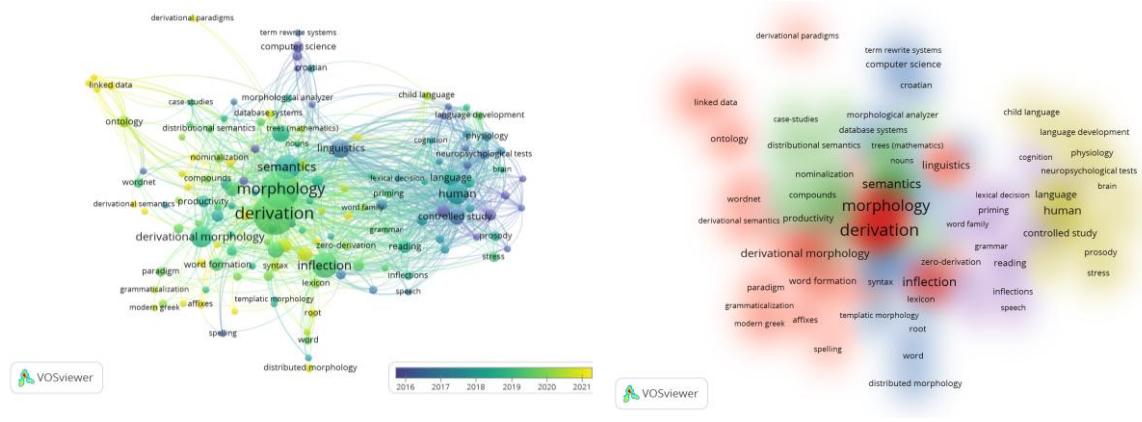


Figure 6. (a) Overlay Visualization and (b) Figure 8. Density Visualization of the Most Connected Keywords.

Moreover, Table 1 also provides the specific breakdown of Cluster 4, the fourth largest cluster in the keyword network visualization. This cluster reveals a distinct focus on the intersection of derivational morphology with psycholinguistics, cognitive science, and language acquisition. Within Cluster 4, several distinct sub-clusters can be identified. Sub-cluster (C.4-1) centers around the cognitive and neural aspects of morphological processing, featuring terms such as “morphological processing,” “brain,” “brain mapping,” “neuropsychological tests,” “magnetic resonance imaging,” and “electroencephalogram.” This highlights a line of research employing neuroimaging techniques and cognitive measures to investigate how morphological information is processed in the brain and how it relates to other cognitive functions. Another sub-cluster (C.4-2) focuses on language acquisition and development, including “language acquisition,” “language development,” “child language,” “language ability,” and “vocabulary.” This suggests a research emphasis on the acquisition of derivational morphology in children, the relationship between morphological knowledge and vocabulary development, and the factors influencing language abilities. A third sub-cluster (C.4-3) revolves around experimental paradigms and cognitive measures, as evidenced by the inclusion of “task performance,” “reaction time,” “stimulus response,” and “controlled study.” This indicates a reliance on quantitative research methods to investigate morphological processing and its impact on cognitive performance. Finally, a sub-cluster (C.4-4) encompassing “prosody” and “stress” suggests an exploration of the interplay between morphology and phonology, particularly in relation to suprasegmental features like prosody and stress. These semantically cohesive sub-clusters within Cluster 4 illustrate the diverse yet interconnected lines of inquiry within this area of derivational morphology research.

Finally, Table 1 details Cluster 5, the smallest, focusing distinctly on the cognitive aspects of word recognition and processing in derivational morphology. It comprises sub-clusters as follows. One prominent sub-cluster (C.5-1) centers around word recognition and lexical access, featuring terms such as “word recognition” and “lexical decision.” This highlights a line of research investigating how morphological information influences the speed and accuracy of recognizing words and accessing their meanings. Another sub-cluster (C.5-2) focuses on the cognitive processes involved in morphological processing including “morphological decomposition” and “morphological awareness.” This suggests a research emphasis on how individuals break down words into morphemes, the conscious awareness of morphological structure, and the broader cognitive mechanisms underlying language comprehension. A third sub-cluster (C.5-3) revolves around the interplay between morphology, frequency, and grammar, as evidenced by the inclusion of “frequency” and “grammar.” This indicates research efforts exploring how the frequency of morphemes and grammatical rules influence morphological processing and representation. Finally, a sub-cluster (C.5-4) encompassing

“Hebrew” and “English” suggests a focus on the morphology and processing of these specific languages, potentially examining language-specific patterns and typological characteristics related to word recognition and morphological awareness. These semantically cohesive sub-clusters within Cluster 5 illustrate the diverse yet interconnected lines of inquiry within this area of derivational morphology research.

Discussion

This study quantitatively analyzed trends and thematic development in derivational morphology (2014-2024). The rising of publications count signifies growing interest, echoing prior work on morphology’s scope (Bauer, 2019). Key journals like *Morphology* and institutions including CNRS and Charles University highlight influential academic networks. Key terms analysis, see also Figures 6(a) and 6(b), revealed five prominent, interconnected thematic clusters, specifying contemporary research areas in this domain. Emphasizing fundamental word formation principles, Cluster 1 centers on morphological concepts. Terms like “affixation,” “derivation,” and “inflection” highlight ongoing interest in these mechanisms and frameworks (e.g., Müller et al., 2016). The co-occurrence of “derivational semantics” and “lexical semantics” highlights the vital role of meaning at the morphology-semantics interface (e.g., Bhadra, 2024). Inclusion of “paradigm” and “typology” reflects investigations into the systematic organization and cross-linguistic variation (e.g., Argus & Kazakovskaya, 2023). However, a critical consideration is whether this cluster consolidates knowledge rather than explores novel frontiers.

Emphasizing the link between word formation and meaning, Cluster 2 focuses on the morphology-semantics interface. Terms like “semantics,” “semantic properties,” and “distributional semantics” demonstrates a sustained interest in meaning encoding within derivational processes (e.g., Laks, 2024). The inclusion of “natural language processing” and “computational linguistics” underscores the increasing application of computational methods to investigate semantic aspects (e.g., Vasilogamvrakis & Sfakakis, 2024). Language-specific terms (e.g., “Russian,” “Turkish”) suggest cross-linguistic studies vital for comprehensive theories (e.g., Bobkova & Montermini, 2023). Nevertheless, a critical needs for more refined methodologies to capture the complex this interplay. Additionally, Cluster 3 emphasizes the morphology-syntax interface, highlighting the link between word formation and syntactic structure. Terms like “syntax” and “grammatical category” underscores the interaction of derivational processes with syntactic rules (e.g., Jaradat & Alkhawaja, 2024). Focus on “conversion” and “compounding” indicates interest in their role in shaping syntactic structure (e.g., Kolbusz-Buda, 2024). Language specific studies (e.g., “German”) address typological variations (e.g., Stewart et al., 2023).

Cluster 4 focuses on the psycholinguistic and neural underpinnings of morphological processing. Terms like “morphological processing,” “brain,” and “neuropsychological tests” highlight the use of cognitive and neuroimaging techniques to study processing in the mind and brain (e.g., Royle & Steinhauer, 2023). Inclusion of “language acquisition” and “child language” suggests a focus on developmental aspects (e.g., Al-Sulaihim et al., 2024). Experimental paradigms, as indicated by terms like “task performance” and “reaction time,” highlights the importance of quantitative methods (e.g., Layes et al., 2019). Nonetheless, a critical consideration is the need for more refined cognitive models explaining the interplay between morphological processing and other cognitive functions. Lastly, Cluster 5 examines the cognitive aspects of word recognition concerning derivational morphology. Terms such as “word recognition,” “lexical decision,” and “priming” indicate interest in how morphological information influences word processing (e.g., Gwilliams et al., 2015). The inclusion of “morphological decomposition” and “morphological awareness” highlights the underlying cognitive processes (e.g., Diamanti et al., 2024). A broader cognitive perspective, encompassing “learning” and “language processing,” explores the acquisition and utilization of

morphological knowledge (e.g., Beraldo & Araújo-Adriano, 2024). Language-specific studies (e.g., Hebrew, English) address typological variations in these cognitive processes (e.g., Cohen et al., 2024). A key consideration remains the necessity for more naturally data- driven research designs.

CONCLUSION

This study conducted a data-driven quantitative analysis utilizing a scientometric approach to explore research trends and thematic development in the field of derivational morphology from 2014 to 2024. The analysis demonstrated significant growth within the field, evidenced by an increase in publications and a diversification of research outlets, while also identifying key contributing authors, prominent institutions, and influential funding bodies. Through keyword co-occurrence analysis, the study revealed distinct thematic clusters centered on core morphological concepts, the morphology-semantics and morphology-syntax interfaces, psycholinguistic perspectives, and cognitive aspects of word recognition, highlighting the contemporary research landscape. However, the study's limitations, including its reliance on a single database (Scopus), the potential subjectivity of author-provided keywords for clustering analysis, and the exclusion of publications in languages other than English, are acknowledged. Furthermore, the quantitative scope provides a broad overview but does not offer in-depth analysis of individual contributions. These limitations suggest productive avenues for future research, such as incorporating expanded data sources, exploring alternative analytical methods like topic modeling, and integrating qualitative approaches to achieve a more comprehensive understanding of this dynamic and evolving domain.

REFERENCES

Al-Sulaihim, N., Abdalla, F., Mahfoudhi, A., & Shaalan, S. (2024). Development of derivational morphology in Kuwaiti Arabic-speaking children. *First Language*, 44(5), 449–473. <https://doi.org/10.1177/01427237241261793>

Amenta, S., Günther, F., & Marelli, M. (2020). A (distributional) semantic perspective on the processing of morphologically complex words. *Mental Lexicon*, 15(1), 62–78. <https://doi.org/10.1075/ml.00014.ame>

Argus, R., & Kazakovskaya, V. V. (2023). Acquisition of diminutives in Russian and Estonian from a typological perspective. In *Diminutives across Languages, Theoretical Frameworks and Linguistic Domains*. <https://doi.org/10.1515/9783110792874-013>

Aronoff, M. (2018). Morphology and words: A memoir. In *The Lexeme in Descriptive and Theoretical Morphology*. <https://doi.org/10.5281/zenodo.1406987>

Bauer, L. (2019). *Rethinking morphology*. Edinburgh. Edinburgh University Prss.

Beraldo, R. L., & Araújo-Adriano, P. Á. (2024). What lexical acquisition has to say about a non-lexicalist architecture of grammar – and vice-versa. *Isogloss*, 10(6). <https://doi.org/10.5565/rev/isogloss.460>

Bhadra, D. (2024). Verb roots encode outcomes: argument structure and lexical semantics of reversal and restitution. *Linguistics and Philosophy*, 47(4), 557–610. <https://doi.org/10.1007/s10988-024-09409-5>

Bobkova, N., & Montermini, F. (2023). A quantitative approach to doublets in Russian denominal adjective construction. *Word Structure*, 16(1), 63–86. <https://doi.org/10.3366/word.2023.0221>

Booij, G. (2016). Construction Morphology. In *The Cambridge Handbook of Morphology* (pp. 424–448). Cambridge University Press. <https://doi.org/10.1017/9781139814720.016>

Caha, P., De Clercq, K., & Vandewyngaerd, G. (2023). Zero morphology and change-of-state verbs. *Zeitschrift Fur Sprachwissenschaft*, 42(1), 35–62. <https://doi.org/10.1515/zfs-2022-2012>

Cohen, Y., Ben-Simon, A., Bar-Siman-Tov, A., Dolev, Y., Karelitz, T., & Levi, E. (2024). Nlp Application in the Hebrew Language for Assessment and Learning. In *The Routledge International Handbook of Automated Essay Evaluation*. <https://doi.org/10.4324/9781003397618-7>

Copot, M., Mickus, T., & Bonami, O. (2022). Idiosyncratic frequency as a measure of derivation vs. inflection. *Journal of Language Modelling*, 10(2), 193–204. <https://doi.org/10.15398/jlm.v10i2.301>

Diamanti, V., Grande, G., Protopapas, A., Melby-Lervåg, M., & Lervåg, A. (2024). Preschool Morphological Awareness and Developmental Change in Early Reading Ability. *Scientific Studies of Reading*, 28(6), 591–613. <https://doi.org/10.1080/10888438.2024.2370843>

Fradin, B. (2015). Blending. *Word-Formation: An International Handbook of the Languages of Europe*, 1, 386–413. <https://doi.org/10.1515/9783110246254-023/HTML>

Gwilliams, L. E., Monahan, P. J., & Samuel, A. G. (2015). Sensitivity to morphological composition in spoken word recognition: Evidence from grammatical and lexical identification tasks. *Journal of Experimental Psychology: Learning Memory and Cognition*, 41(6), 1663–1674. <https://doi.org/10.1037/xlm0000130>

Haley, C., Goldwater, S., & Ponti, E. M. (2024). Corpus-based measures discriminate inflection and derivation cross-linguistically. *Journal of Language Modelling*, 12(2), 477–529. <https://doi.org/10.15398/jlm.v12i2.351>

Hood, W. W., & Wilson, C. S. (2001). The literature of bibliometrics, scientometrics, and informetrics. *Scientometrics*, 52(2), 291–314. <https://doi.org/10.1023/A:1017919924342>

Hüning, M., & Booij, G. (2014). From compounding to derivation the emergence of derivational affixes through “constructionalization.” *Folia Linguistica*, 48(2), 579–604. <https://doi.org/10.1515/flin.2014.019>

Jaradat, A., & Alkhawaja, L. (2024). A split morphosyntactic analysis of diminutives in two Arabic varieties. *Cogent Arts and Humanities*, 11(1). <https://doi.org/10.1080/23311983.2024.2431461>

Kleineberg, D. (2023). Collection nouns as a derivational category in Spanish Analysing the productivity of collective suffixes on the basis of ad hoc constructs. In *Constructional Approaches to Language* (Vol. 34). <https://doi.org/10.1075/cal.34.02kle>

Kolbusz-Buda, J. (2024). Between compounding and phrasal derivation: Polish complex nouns in sam(o)-. *Word Structure*, 17(3), 112–133. <https://doi.org/10.3366/word.2024.0240>

Körtvélyessy, L., & Štekauer, P. (2020). Complex Words: Advances in Morphology. In *Complex Words: Advances in Morphology*. <https://doi.org/10.1017/9781108780643>

Laks, L. (2024). Semantic transparency and doublet formation: the case of Hebrew location nouns. *Morphology*, 34(3), 219–242. <https://doi.org/10.1007/s11525-024-09421-2>

Layes, S., Khenfour, H., Lalonde, R., & Rebai, M. (2019). Orthographic and Morphological Masked Priming Effects in Arabic: Evidence from Lexical Decision Task in Children with and Without Dyslexia. *Reading Psychology*, 40(3), 243–268. <https://doi.org/10.1080/02702711.2019.1614127>

Liceras, J. M., & Klassen, R. (2019). Compounding and derivation: On the “promiscuity” of derivational affixes. *Linguistic Approaches to Bilingualism*, 9(1), 42–72. <https://doi.org/10.1075/lab.16026>

Lieber, R. (2017). Derivational Morphology. In *Oxford Research Encyclopedia of Linguistics*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780199384655.013.248>

Lieber, R., & Plag, I. (2022). The semantics of conversion nouns and -ing nominalizations: A quantitative and theoretical perspective. *Journal of Linguistics*, 58(2), 307–343. <https://doi.org/10.1017/S0022226721000311>

Luschützky, H. C. (2015). Word-formation in natural morphology. *Word-Formation: An International Handbook of the Languages of Europe*, 1, 123–144.

<https://doi.org/10.1515/9783110246254-011/HTML>

Morita, J. (2024). Corpus-based Research into Derivational Morphology: A Comparative Study of Japanese and English Verbalization. *Proceedings of the International Conference Computational Linguistics in Bulgaria*, 178–186.

Müller, P. O., Ohnheiser, I., Olsen, S., & Rainer, F. (2016). Word-formation: An international handbook of the languages of Europe. In *Word-Formation: An International Handbook of the Languages of Europe* (Vol. 5). <https://doi.org/10.1515/9783110424942>

Nugraha, D. S. (2021). Morphosemantic Features of Derivational Affix {Me(N)-} in The Indonesian Denumeral Verb Constructions. *Sirok Bastra*, 9(2), 125–134. <https://doi.org/10.37671/sb.v9i2.317>

Nugraha, D. S. (2024a). A Morphological Analysis of the Indonesian Suffixation: A Look at the Different Types of Affixes and Their Semantic Changes. *GEMA Online Journal of Language Studies*, 24(4), 109–132. <https://doi.org/10.17576/gema-2024-2404-07>

Nugraha, D. S. (2024b). Analyzing Prefix /me(N)-/ in the Indonesian Affixation: A Corpus-Based Morphology. *Theory and Practice in Language Studies*, 14(6), 1697–1711. <https://doi.org/10.17507/tpls.1406.10>

Pustejovsky, J. (2020). The Generative Lexicon. *The Generative Lexicon*. <https://doi.org/10.7551/MITPRESS/3225.001.0001>

Royle, P., & Steinhauer, K. (2023). Neural Correlates of Morphology Computation and Representation. In *Neuromethods* (Vol. 202). https://doi.org/10.1007/978-1-0716-3263-5_14

Sooryamoorthy, R. (2020). *Scientometrics for the Humanities and Social Sciences*. Routledge. <https://doi.org/10.4324/9781003110415>

Steinhauer, A. (2015). Clipping. *Word-Formation: An International Handbook of the Languages of Europe*, 1, 352–363. <https://doi.org/10.1515/9783110246254-021>

Štekauer, P. (2015). Backformation. *Word-Formation: An International Handbook of the Languages of Europe*, 1, 340–352. <https://doi.org/10.1515/9783110246254-020>

Stephany, U. (2021). The development of derivation in early Greek first language acquisition. In *Language Acquisition and Language Disorders* (Vol. 66). <https://doi.org/10.1075/lald.66.02ste>

Stewart, J., Brown, D., Bennett, P., Robles-García, P., Sánchez-Gutiérrez, C. H., Marcos Miguel, N., Vitta, J. P., Nicklin, C., Stoeckel, T., & McLean, S. (2023). The contribution of affixes to productive English vocabulary knowledge for Chinese, German and Spanish learners: A comparison. *System*, 115. <https://doi.org/10.1016/j.system.2023.103035>

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>

van Eck, N. J., & Waltman, L. (2023). *VOSviewer* (1.6.20). Universiteit Leiden.

van Klinken, C. W., & Hajek, J. (2020). Double agent, double cross? Or how a suffix changes nature in an isolating language: Dór in Tetun Dili. In *Typological Studies in Language* (Vol. 129). <https://doi.org/10.1075/tsl.129.08kli>

Vasilogamvrakis, N., & Sfakakis, M. (2024). Ontological Modeling of Lists for Modern Greek Derivation. In *Communications in Computer and Information Science: Vol. 2048 CCIS*. https://doi.org/10.1007/978-3-031-65990-4_16

Waltman, L., & van Eck, N. J. (2019). *Field Normalization of Scientometric Indicators* (pp. 281–300). https://doi.org/10.1007/978-3-030-02511-3_11