

RESEARCH ARTICLE

The evolution of compounding research in semantics: A decade of scientometric evidence (2014—2024)

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ABSTRACT

Although compounding has been widely examined within linguistic research, a systematic overview of its semantic research landscape remains underdeveloped. This study addresses this gap by offering a scientometric mapping of trends and thematic orientations in semantic research on compounding. Drawing on a corpus of 376 publications indexed in the Scopus database between 2014 and 2024, the analysis adopts a quantitative approach and employs VOSviewer to examine publication patterns, thematic structures, and research trajectories. The findings point to a steadily expanding field, with an average annual increase of approximately three publications and an overall growth of 187.5% across the eleven-year period. *Reading and Writing, Cognition, and Mental Lexicon* emerge as the most prominent publication venues. Thematic analysis identified three principal clusters: (a) “Compounding Formation and Description” (40.71%), encompassing terms such as “affixation,” “morphology,” “neologism,” and “word formation process,” (b) “Cognitive and Developmental Aspects of Compounding” (20.09%), characterized by keywords including “morphological awareness,” “comprehension,” “development,” and “student,” and (c) “Semantic Interpretation and Theoretical Frameworks” (29.20%), which includes terms such as “word meaning,” “semantic composition,” “syntax,” and “theory.” Taken together, these findings offer insights into the current state and trajectory of compounding research in the light of semantics, highlighting key themes within the current patterns of advancement.

Keywords: compounding; semantic research, research theme, research trend.**ARTICLE HISTORY**

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Compounding, as a truly universal and cross-linguistic word formation process, indeed involves combining two or more independent words to forms an entirely new lexical unit with a distinctive meaning (Aikhenvald et al., 2020; Lieber & Štekauer, 2011). This process sits at the crossroads of morphology (Booij, 2020; Hüning & Booij, 2014), semantics (Lieber

& Plag, 2022; Nugraha, 2023, 2025d, 2026), and syntax (Bîlbîie et al., 2021; Vogel, 2018). This intersectional nature makes compounding an intriguing object of study, as it demands understanding how a word's formal structure (morphology) interacts with its meaning (semantics) and its role in sentence construction (syntax). For instance, the compound *blackboard* does not simply combine the morphemes *black* and *board*; it also carries a semantic interpretation that is not merely the sum of its parts' meanings, while its syntactic function can vary by position in the sentence. Further, studying compounding can reveal how different languages prioritize these intersecting domains. Some languages tend to maintain more transparent semantic relations between compound constituents, whereas others allow more metaphorical interpretations (Heine et al., 2016; Liceras & Klassen, 2019). In certain contexts, compounding studies also examine the cognitive mechanisms underlying the formation and interpretation of these complex lexical structures, the semantic relations between components, and their integration into the mental lexicon (Kjellander, 2018; Momenian et al., 2021; Semenza, 2021). Moreover, research on compounding provides understanding of links between language structure, cognition, and communication, and offers insights into the nature of language and its role in human thought (Taylor, 2015; ten Hacken, 2019).

Although studies on compounding have developed extensively, a significant gap remains in the systematic analysis of this field's evolution and its emerging thematic trends. A number of individual studies have examined specific aspects of compounding, such as the mechanism of affixes in determining compound word category (Al-Haj Eid et al., 2024; Toluspayeva et al., 2024; Zingler, 2024), semantic compositionality (Fritz & Baggio, 2020; Mithun, 2022; Yang, 2024), or syntactic processing, that is how compound words are integrated into sentence structure (Mattiello, 2024; Ntelitheos, 2022; Sugimoto et al., 2024), yet a comprehensive description of the overall research landscape remains unavailable. This fragmentation of knowledge potentially hinders a holistic understanding of the field's developmental direction, the connections among different research lines, and the identification of new trends and future research directions. To bridge this gap, the present study adopts a scientometric approach (Henneken & Kurtz, 2019; Hood & Wilson, 2001), utilizing quantitative analysis to map the intellectual structure of semantic research on compounding. In this study, scientometrics is operationally defined as a quantitative approach that measures and visualizes the intellectual structure of a field through the analysis of citation patterns, co-citation, and bibliographic clustering, thereby enabling the

objective identification of thematic clusters and genealogical relations among scientific works. This approach allows for the presentation of a macro-level perspective of the field.

In more detail, previous research on compounding has been conducted within both theoretical and empirical paradigms. Foundational works (Lieber, 2001, 2010, 2011) and (Plag, 2003, 2019, 2020) laid the groundwork for understanding morphological and semantic constraints in compound word formation, while other scholars (e.g., Jackendoff, 2009; Jackendoff & Audring, 2019; Taylor, 2011; ten Hacken, 2019) explored the cognitive mechanisms underlying compound word interpretation. More recent studies have then highlighted neuro-cognitive aspects of compound processing (Hochmann et al., 2017; Libben, 2014; Zhan et al., 2023), the role of cross-linguistic variation in compound formation (Akan et al., 2024; Choi et al., 2018; Mohaideen Fathima & Sherif, 2023), and the acquisition of compounding skills (Dubé & Elin Thordardottir, 2024; Xia et al., 2024; Xie & Yeung, 2024). Collectively, these studies have provided valuable analyses on compounding, yet a mapping of the relationships among them has not been fully realized (cf. Nugraha, 2024a).

The present study addresses the aforementioned knowledge gap through a scientometric analysis of a corpus comprising 376 publications on compounding semantics, drawn from the Scopus database. By mapping the intellectual landscape of compounding research, this study is expected to promote a deeper understanding of the field's developmental trajectory, to recognize emerging trends, and to offer projections for future research agendas. More specifically, this study is directed towards answering the following research questions: (a) what are the main research trends and dominant themes that have characterized the field of compounding semantics, and how have these themes evolved over the period 2014 to 2024; and (b) who are the key researchers, institutions, and publishers shaping the development of the field of compounding semantics, and what patterns of collaboration and networks of influence exist among them?

METHOD

The present study adopts a scientometric approach. Scientometrics is a field of study that applies bibliometric methods to analyze scientific and academic literature, thereby enabling quantitative understanding of research trends, collaboration patterns, and scholarly impact within a given domain (Hood & Wilson, 2001; Sooryamoorthy, 2020; Waltman & van Eck, 2019). This quantitative approach allows for a data-driven description of the current state of the research field under investigation. In line with this objective, the data for this study consist of a corpus of 376 publications drawn from the Scopus database,

with a publication timeframe between 2014 and 2024. Scopus, as a comprehensive publication database, was chosen because it guarantees peer-reviewed literature and its wide coverage. This search query was designed carefully to ensure data relevance and comprehensiveness, surrounding various terms related to compounding semantics as exemplified in Table 1.

Query	Criteria	Inclusion	Exclusion	N of articles
“(TITLE-ABS-KEY (morphological AND compounding) OR TITLE-ABS-KEY (lexical AND compounding) OR TITLE-ABS-KEY (word AND composition) AND ALL (semantics) OR ALL (semantic AND analysis))”	Year	2014-2024	<2014 & >2024	1394
	Subject area	Social Sciences; Art & Humanities	Other subject area	798
	Document type	Article	Non-article	568
	Publication stage	Final	Pre-print	559
	Source type	Journal	Non-journal	554
	Language	English	Non-English	376
FINAL DATASET				376

Table 1. Dataset Formation in Data Corpus Construction

Data analysis in this study was conducted through two main stages. The first stage involved analysis of bibliographic information. Bibliographic information from the publications, including author names, affiliations, year of publication, journal title, and citation count, was extracted and analyzed to identify major trends and patterns within the field. This analysis yielded a description of leading researchers, prominent institutions, influential journals, and the overall growth of the field over time. The second stage comprised keyword-based thematic clustering. To uncover the thematic structure of the research landscape, a keyword co-occurrence analysis was performed using VOSviewer software (version 1.6.20), a tool for constructing and visualizing bibliometric networks (van Eck & Waltman, 2010, 2023). This analysis involved several steps, namely keyword extraction, threshold setting, relevance scoring, filtering, and co-occurrence analysis.

As the second stage, keywords were extracted from the titles, abstracts, and keyword fields of the publications. A minimum occurrence threshold of 10 was set to ensure that only the most frequent and most relevant keywords were included in the analysis. From an initial total of 10,132 identified terms, 196 terms met this threshold. Next, relevance scores were calculated for each of these 196 terms, and the 60% most relevant terms (amounting to 118 terms) were selected for further analysis. After validating the results by removing irrelevant terms, the final set of keywords used in the analysis consisted of 113 terms. The final stage, co-occurrence analysis, was performed using a binary counting method, whereby a relationship between two keywords was considered

to exists if they appeared together in at least one publication. The unit of analysis was all keywords, so that co-occurrence relationships were examined across the entire dataset. This analysis produced network and overlay visualizations, as well as density maps.

RESULTS AND DISCUSSION

In response to the two research questions guiding this study, the following findings are organized into two main subsections: (a) Intellectual Structure and Thematic Dynamics and (b) Key Actors, Collaboration, and Networks of Influence in Knowledge Production. These subsections are presented in turn below.

Intellectual Structure and Thematic Dynamics

Annual Scientific Outputs

Regarding annual scientific outputs, Figure 1 presents the number of yearly publications related to semantic research on compounding over the period from 2014 to 2024. These data show a clear increasing trend in scientific production during this timeframe. Specifically, the first year of observation, 2014, shows the lowest number of publications, with a total of 16 documents. This number then rose very significantly to 29 documents in 2015, representing a growth of 81.25% within a single year. The following years, 2016 and 2017, show a period of relative stability with small fluctuations in the range of 27 to 30 documents. However, a rather notable surge was observed in 2019, with 34 documents, which was then followed by a peak in publications in 2020 of 47 documents. This peak, which is the highest annual output across the observation period, was subsequently followed by a sharp decline to 32 documents in 2021, indicating that certain factors potentially influenced publication levels in that year. Thereafter, the data show a consistent increase to 39 documents in 2022 and reaching 46 documents in each of 2023 and 2024.

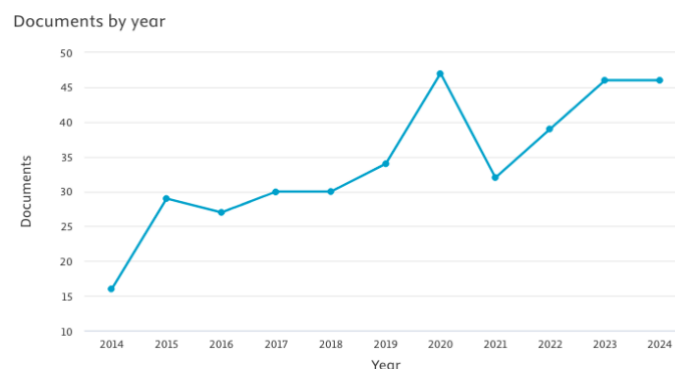


Figure 1. Annual Scientific Output

Based on quantitative analysis of the data in Figure 1, the average annual growth in publication output over the period from 2014 to 2024 is approximately three documents per year. This growth, although not linear, indicates a sustained interest and consistent expansion in the domain of semantic research on compounding. Calculating the total percentage growth from 2014 to 2024 reveals a very significant increase of 187.5%, from 16 documents to 46 documents. This substantial expansion confirms the growing academic attention devoted to this field of linguistics. Furthermore, fluctuations in publication levels, particularly the sharp surge in 2020 followed by a decline in 2021, merit further examination. Such variation is likely correlated with external factors, such as funding availability, shifts in research focus, or particular advances within the field that spurred increased publication numbers. The persistently high publication levels in 2023 and 2024 indicate a consolidation of growth and potentially mark a more mature phase in the field's developmental trajectory. In summary, Figure 1 presents a compelling visual representation of the quantitative evolution of semantic research on compounding, highlighting both the growth aspects and the variability output over the past decade (cf. Nugraha, 2025b, 2025a).

Thematic Clustering of Keywords

One important findings of this study concern the thematic clustering of keywords as presented in Table 2. In detail, Figure 2 presents a network visualization of the thematic keyword clusters obtained from the corpus of publications analyzed in semantic research on compounding. This visualization uses a color scheme to distinguish three main clusters, each representing a specific thematic concentration of keywords. The red cluster, which comprises 40.71% of all keywords, centers on the theme of *"Compounding Formation and Description"*, encompassing terms such as *"affixation"*, *"morphology"*, *"neologism"*, and *"word formation process"*. The green cluster, representing 30.09%, focuses on the theme of *"Cognitive and Developmental Aspects of Compounding"*, with keywords like *"morphological awareness"*, *"comprehension"*, *"development"*, and *"student"*. Meanwhile, the blue cluster, covering 29.20%, centers on the theme of *"Semantic Interpretation and Theoretical Frameworks"*, which includes terms such as *"word meaning"*, *"semantic composition"*, *"syntax"*, and *"theory"*. This network visualization effectively captures the interconnections among these thematic clusters, while also illustrating the complex and interconnected nature of semantic research on compounding.

novel compound words; (b) how does cross-linguistic variation in morphological typology affect the productivity and semantic transparency of compound formation; and (c) what role do morpheme boundaries and internal morphological structure play in determining the semantic relations between constituents within a compound word. Next, for subcluster C1-B, several questions can be explored, for example: (a) how do the semantic features of component words interact and contribute to the overall meaning of a compound, and what cognitive mechanisms underlie this process of compositionality; (b) what are the lexical and semantic constraints governing the formation of novel compounds, and how do these constraints vary across semantic domains and conceptual categories; and (c) how does the integration of novel compounds into the mental lexicon affect the organization and representation of existing lexical entries, and what are the implications for lexical access and retrieval. Finally, for subcluster C1-C, further questions that could be investigated include: (a) what diachronic processes contribute to shifts and evolution in compound meaning over time, and how do these processes interact with language contact and sociolinguistic factors; (b) how does the productivity of compounding interact with other word formation processes such as derivation and lexical innovation; and (c) what cognitive and communicative factors drive the creation and use of novel compounds, and how do these factors vary across different discourse contexts and communicative purposes. These alternative questions are considered relevant and useful for further research, as suggested by Booij (2020) and Olsen (2015).

Furthermore, Cluster 2, which comprises 34 keywords (30.09%), examines cognitive and developmental aspects of compounding. Within this cluster, several subclusters emerge that highlight more specific areas of research interest. On subcluster (C2-A) centers on morphological awareness, encompassing terms such as “*morphological awareness*”, “*ability*”, “*knowledge*”, and “*task*”. This indicates a focus on the cognitive processes involved in recognizing and manipulating morphological structures in compound words. Another subcluster (C2-B) emphasizes learning and developmental aspects, with keywords such as “*age*”, “*child*”, “*development*”, “*grade*”, “*learning*”, and “*student*”. This focus reflects research exploring how compounding skills develop across different age groups and educational stages. Additionally, a further subcluster highlights linguistic performance and outcomes, with terms such as “*comprehension*”, “*difficulty*”, “*effect*”, “*influence*”, “*performance*”, “*production*”, dan “*writing*”. This subcluster indicates attention to how compounding abilities affect various language skills and academic achievement. Overall, in line with previous notable works (e.g., Kim & Pytkänen, 2019; Pytkänen et al., 2014a; Zhang & Pytkänen, 2018), Cluster 2 reveals a comprehensive investigation of the cognitive foundations,

developmental trajectories, and educational implications of compound acquisition and processing.

Cluster	N	(%)	Color in Figure 1	Keywords
1	46	40.71	Red	adverb; affix; affixation; attention; class; complex word; compounding; concept; content; conversion; creation; degree; derivation; description; dictionary; element; field; focus; formation; kind; lexicon; mean; morpheme; morphology; name; neologism; new word; perspective; phenomenon; place; presence; principle; problem; productivity; relevance; researcher; root; Russian; Russian language; state; subject; system; technique; topic; word formation; word formation process
2	34	30.09	Green	morphological awareness; ability; addition; age; child; Chinese; comprehension; contribution; development; difference; difficulty; effect; end; frequency; grade; implication; importance; individual; influence; knowledge; measure; participant; performance; production; quality; role; sample; significant difference; speech; student; task; vocabulary; writing
3	33	29.20	Blue	word meaning; theory; syntax; syntactic sentence; sense; semantic composition; respect; representation; reference; question; processing; position; phrase; line; light; lexical item; item; interpretation; instance; information; idea; head; German; experiment; evidence; event; construction; constituent; compound word; compound; claim; argument
TOTAL	113	100		

Table 2. Thematic Clustering of Keywords

Based on the subclusters identified within Cluster 2, several research questions can be formulated to guide further studies on the cognitive and developmental aspects of compounding. For subcluster C2-A, questions that could be examined include: (a) how does explicit teaching of morphological awareness focused on compounding affect reading comprehension and vocabulary acquisition across different age groups; (b) to what extent do individual differences in morphological awareness predict performance on tasks involving analysis, production, and semantic interpretation of compounds; and (c) how can assessments of morphological awareness be refined to specifically target compounding abilities and provide a more empirical understanding of individual variation in morphological processing. For subcluster C2-B, relevant questions include: (a) how do developmental trajectories of compound acquisition vary across different linguistic environments and across compound types and semantic relations; (b) how do language-specific factors such as orthographic transparency and morphological complexity affect compound processing in bilingual and multilingual children; and (c) what cognitive and linguistic prerequisites enable successful compound formation and understanding, and how do these interact with other aspects of language development. For subcluster C2-C, further questions could be directed at: (a) how compounding proficiency contributes to overall language competence,

including reading fluency, writing skills, and oral communication; (b) what specific challenges individuals with language learning difficulties face in compound acquisition and processing, and how interventions can be designed to address these challenges; and (c) how the ability to parse and analyze compounds contributes to comprehension of complex texts and academic vocabulary, and how this skill can be effectively developed in educational settings. Based on these alternative research questions, Taylor (2015) and Nugraha (2024b) suggest that a cognitive grammar perspective should be considered in the analysis of compounding as a cross-linguistic word formation phenomenon.

Furthermore, Cluster 3, which comprises 33 keywords (29.20%), focuses on the semantic interpretation of compounds and the theoretical frameworks used in their analysis. Within this cluster, several subclusters emerge that highlight more specific areas of research interest. One subcluster (C3-A) centers on semantic composition, encompassing terms such as “*word meaning*”, “*semantic composition*”, “*sense*”, “*interpretation*”, and “*lexical item*”. This focus indicates attention to how the meanings of individual components combine to form the overall meaning of a compound word. Another subcluster (C3-B) emphasizes syntactic and structural aspects, with keywords such as “*syntax*”, “*syntactic sentence*”, “*position*”, “*construction*”, “*constituent*”, and “*head*”. This reflects research exploring the syntactic role and relations among elements within compounds and their impact on semantic interpretation. Additionally, a further subcluster (C3-C) highlights theoretical frameworks and argumentation, with terms such as “*theory*”, “*representation*”, “*reference*”, “*claim*”, and “*argument*”. This subcluster indicates interest in the development and evaluation of theoretical models that explain the semantic properties of compounds. Overall, in line with several previous studies (e.g., Günther et al., 2020; Günther & Marelli, 2019), Cluster 3 reveals a focus of investigation on the semantic complexity of compounds, which, if studied more specifically in certain languages, can show signs of universality patterns.

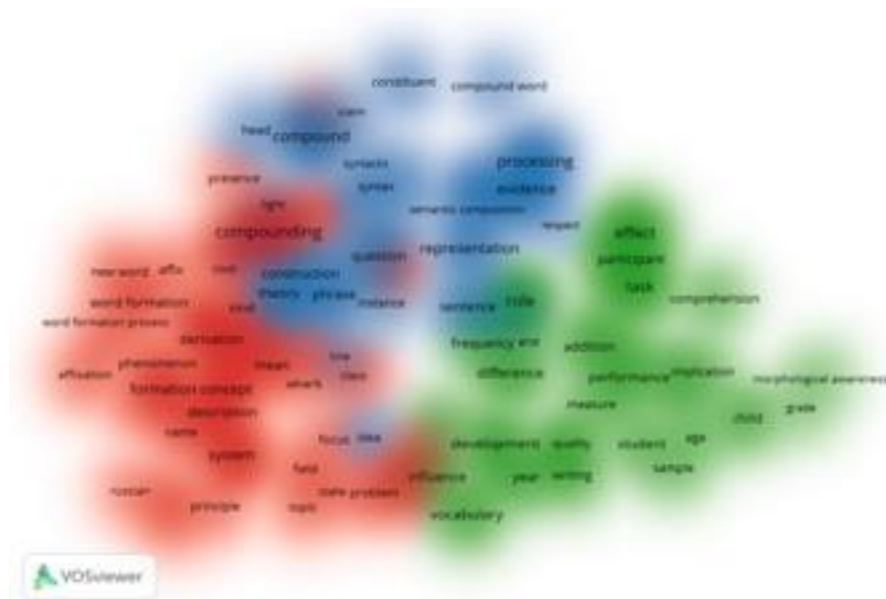


Figure 4. Density Visualization of Keyword Thematic Grouping

Finally, for subcluster C3-C, a number of important questions that can be examined include: (a) how existing theoretical frameworks, such as Conceptual Metaphor Theory and Construction Grammar, can be expanded and refined to provide a more comprehensive explanation of the semantic and conceptual motivations underlying the formation of compound words; (b) what are the main arguments supporting and opposing various theoretical perspectives regarding the nature of compound word meaning, such as lexical approaches versus constructionist views, and how empirical evidence can be used to evaluate these competing claims; and (c) how computational modeling and natural language processing techniques can be utilized to analyze large-scale corpora and provide new insights into the semantic patterns and regularities that govern the formation and interpretation of compound words. In line with the suggestions of Heine et al., (2016) the semantic interpretation of compound words needs to be consistently supported by appropriate and relevant theoretical frameworks used in the analysis process.

Furthermore, to illustrate the evolution and interrelation of research themes over time, Figure 3 presents an overlay visualization of the keyword thematic grouping. The color gradient, ranging from blue (2016.0) to yellow (2020.5), represents the temporal dimension, with brighter colors indicating more recent publications. This visualization reveals a dynamic research focus landscape. In the early period, represented by blue and green hues, themes related to morphological awareness, cognitive processing, and developmental aspects of compounding appear more dominant, as indicated by the emergence of keywords such as “morphological awareness,” “child,” “grade,” and “comprehension.” However, in more recent years, there is a

visible shift toward research that is more theoretically and semantically oriented, represented by yellow hues. This shift is reflected in the increased prominence of keywords such as “theory,” “representation,” “semantic composition,” and “syntax.” Overall, this overlays visualization effectively captures the temporal dynamics of compounding research, highlighting the transition from studies dominated by cognitive and developmental approaches toward a more prominent focus on theoretical frameworks and semantic analysis. In line with several previous views (e.g., Adamson, 2024; Kolbusz-Buda, 2024; Lane, 2024), these findings indicate that this field of study has entered an increasingly mature phase, with an ever-stronger emphasis on developing comprehensive models to explain the complexity of meaning and interpretation in compound words.

As a complement to the overlay visualization in Figure 2, Figure 4 presents a density visualization of the keyword thematic grouping. In this representation, the level of color density indicates the concentration of research in certain thematic areas. The red cluster, which focuses on “Compounding Formation and Description”, shows the highest density level, particularly around keywords such as “compounding”, “word formation”, “affixation”, and “morphology”. Consistent with Bauer et al., (2015), these findings indicate a substantial concentration of research in exploring the structural and descriptive aspects of compounding. The green cluster, which discusses “Cognitive and Developmental Aspects of Compounding”, shows a moderate density level, with denser areas around keywords such as “morphological awareness”, “child”, and “development”. In the view of Taylor (2015), this indicates a quite significant research focus, although not overly concentrated, on cognitive and developmental dimensions. Meanwhile, the blue cluster related to “Semantic Interpretation and Theoretical Frameworks” shows a relatively lower density level compared to the other clusters. In line with Mustafayeva (2020), these findings indicate that although research on semantic interpretation and theoretical frameworks has developed, its concentration level is still lower compared to research oriented towards descriptive and cognitive aspects. Overall, the density visualization in Figure 3 reinforces the findings from the overlay visualization, by emphasizing the dominance of research on compounding formation and description, which is followed by cognitive and developmental aspects, while semantic interpretation and theoretical frameworks receive relatively lower concentrated attention.

Key Actors, Collaboration, and Influence Networks in Knowledge Production

Prominent Journal Publishers

Regarding prominent journal publishers, Figure 5 illustrates the distribution of publications related to semantic research on compounding in ten major journals during the period from 2014 to 2024. The data indicates a heterogeneous landscape of scientific output, with Reading and Writing (Q1 | SJR: 1.14) occupying the top position with the highest number of publications, namely 12 documents. This journal exhibits relatively consistent, albeit not overly high, output throughout the observation period, which indicates a sustained focus on this research field. Journals such as Cognition (Q1 | SJR: 1.59) and Mental Lexicon (Q1 | SJR: 0.4) follow with 8 documents each, reflecting a moderate level of engagement with the topic of compounding. The Journal of Experimental Psychology: Learning, Memory, and Cognition (Q1 | SJR: 1.17) contributed 7 documents, which shows quite notable engagement despite a more limited frequency. Meanwhile, Brain and Language (Q1 | SJR: 0.88), Journal of Neurolinguistics (Q1 | SJR: 0.63), Linguistics (Q1 | SJR: 0.56), and Word Structure (Q1 | SJR: 0.5) each recorded 6 documents, indicating a consistent but not dominant presence in this field of study. Computational Linguistics (Q1 | SJR: 1.37) and Languages (Q1 | SJR: 0.4) show a lower number of publications, namely 5 documents each, which suggests more selective engagement with aspects of compounding semantics.

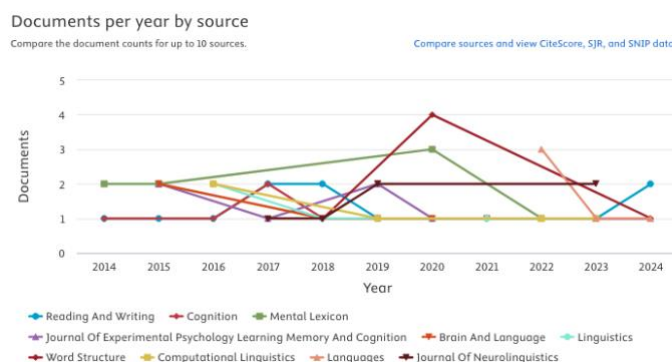


Figure 5. Prominent Journal Publishers

Quantitatively, the average number of publications in those ten journals is 7 documents over the eleven-year period. However, this average tends to be distorted by the high publication output in the journal Reading and Writing, which indicates a quite wide distribution of publication frequency across journals. The data shows that the majority of journals (7 out of 10) have only published 6 documents or fewer, which indicates that although this topic is relevant, compounding has not become a primary focus for most of these journals. The variation in publication levels

across journals can be attributed to several factors, including the scope and specific focus of each journal, the prevalence of research related to compounding in the scientific fields they represent, and general trends in linguistic research. Furthermore, fluctuations in publication output from year-to-year show that interest in semantic research on compounding is dynamic and influenced by changing research priorities and potential shifts in focus within this field of study. In this context, the consistency of the journal Reading and Writing appears notable, reflecting a sustained commitment to the development of research in that field.

No.	Source	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1.	Reading and Writing	1.591	1.421	1.592	1.729	1.322	1.335	1.249	1.668	1.65	1.701
2.	Cognition	1.934	1.778	1.753	1.742	1.844	1.729	1.583	1.778	1.706	1.6
3.	Mental Lexicon	0.746	0.558	0.601	0.838	0.419	0.646	0.422	0.709	0.403	0.51
4.	Journal of Experimental Psychology	1.575	1.367	1.258	1.348	1.51	1.548	1.335	1.32	1.109	1.227
5.	Brain and Language	1.167	1.203	1.209	1.071	1.162	1.123	1.036	1.097	0.969	0.942
6.	Journal of Neuro-linguistics	0.943	0.987	0.704	0.873	0.812	1.076	0.847	0.945	0.906	0.866
7.	Linguistics	1.222	1.288	1.385	1.268	1.818	1.189	1.432	1.598	1.782	1.503
8.	Word Structure	0.996	1.277	0.6	0.89	1.362	1.51	1.413	1.337	1.129	1.491
9.	Computational Linguistics	4.443	3.007	4.43	2.351	3.946	2.322	2.621	2.718	3.456	3.771
10.	Languages	-	-	-	0.428	0.323	0.543	0.62	0.793	0.927	0.865

Table 3. List of SNIP Coefficients in Ten Prominent Journals

Furthermore, Table 3 presents the Source Normalized Impact per Paper (SNIP) values per year for the ten most prominent journals that publish research on compounding. SNIP is an empirical measure of journal impact that considers the number of citations a journal's publications receive relative to the average citations in the subject field. This metric allows for a fairer comparison between journals across different scientific specializations. The table shows fluctuations in SNIP values for each journal from year to year, reflecting variations in impact and citation patterns of the published articles. Some journals, such as Reading and Writing and Cognition, show relatively stable SNIP values, indicating the consistency of their publication impact over time. Conversely, other journals, such as Mental Lexicon and Word Structure, show more notable fluctuations, suggesting greater variability in the impact of the published research. Specifically, Computational Linguistics consistently shows high SNIP values, reflecting the significant impact of computational approaches in this field. Overall, the table underscores the dynamic nature of journal impact and the importance of considering SNIP values alongside other metrics when evaluating the significance and influence of publications in the field of compounding research.

Prominent Researchers

In examining prominent researchers, Figure 6 illustrates the distribution of publications related to semantic research on compounding among fifteen leading authors. The data shows a clear hierarchy in scientific output, with Pylkkänen, L. exhibiting a significantly higher number of publications compared to other authors, reaching 7 documents. This substantial contribution underscores the central role of Pylkkänen, L. within this field of study. Following this top position, there is a group of researchers consisting of Gagné, C.L., Günther, F., Li, H., Libben, G., Marelli, M., Mattiello, E., and Spalding, T.L., who each contributed 3 documents. This pattern reflects a consistent engagement with the topic of compounding and demonstrates the existence of a core community of scholars actively contributing to the semantic understanding of compounding. Other researchers, namely Aguirre, M., Appah, C.K.I., Baggio, G., Bemis, D.K., Benigni, V., Brennan, J.R., and Cain, K., are each recorded with 2 documents, indicating a moderate level of contribution.

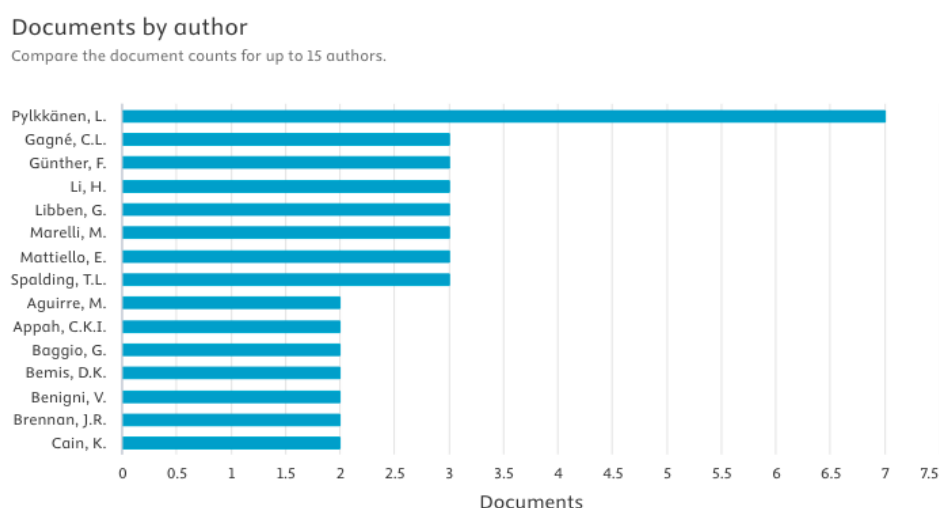


Figure 6. Prominent Researchers

Quantitatively, the average number of publications among these fifteen researchers is approximately 3 documents. However, this average is heavily influenced by the high publication output of Pylkkänen, L., which indicates a skewed distribution. The median number of publications is 3, indicating that most researchers have contributed 3 documents or fewer. The range of publication counts, from 2 to 7 documents, underscores the variation in scientific output in this field of study. Specifically, the contribution of Pylkkänen, L., which exceeds double the average value, shows a concentrated focus and sustained research interest in the semantics of compounding. The fact that eight researchers have each contributed 3 documents reflects the presence of a core academic community actively involved in this field of linguistic study.

Meanwhile, the seven other researchers who have each contributed 2 documents indicate a broader engagement with the topic of compounding, possibly as part of a more diverse range of research interests.

No.	Year	Title	Citation
1.	2014	"LSAfun - An R package for computations based on Latent Semantic Analysis"	134
2.	2018	"Does writing system influence the associations between phonological awareness, morphological awareness, and reading? A meta-analysis"	110
3.	2017	"Vocabulary acquisition through cloze exercises, sentence-writing and composition-writing: Extending the evaluation component of the involvement load hypothesis"	93
4.	2020	"Lack of selectivity for syntax relative to word meanings throughout the language network"	85
5.	2014	"Building phrases in language production: A MEG study of simple composition"	74
6.	2014	"The nature of compounds: A psychocentric perspective"	66
7.	2015	"The LATL as locus of composition: MEG evidence from English and Arabic"	61
8.	2017	"Pauses in written composition: on the importance of where writers pause"	60
9.	2020	"Composition is the Core Driver of the Language-selective Network"	58
10.	2019	"Still a Pain in the Neck: Evaluating Text Representations on Lexical Composition"	58

Table 4. Ten Most Cited Article Titles

Furthermore, Table 4 presents the ten most-cited publications in the field of compounding semantics. These publications cover a diverse range of topics, including computational linguistics, language production, morphological awareness, and syntax. The publication with the highest citation count, "*LSAfun - An R package for computations based on Latent Semantic Analysis*" (Günther et al., 2014), underscores the importance of computational tools in analyzing semantic relations. A number of other publications focus on the cognitive processes involved in language production and comprehension, such as "*Building phrases in language production: A MEG study of simple composition*" (Pylkkänen et al., 2014b) and "*Lack of selectivity for syntax relative to word meanings throughout the language network*" (Fedorenko et al., 2020). Other publications examine the role of morphological awareness in the development of reading ability, as demonstrated by "*Does writing system influence the associations between phonological awareness, morphological awareness, and reading? A meta-analysis*" (Ruan et al., 2018). This diversity of topics reflects the interdisciplinary nature of compounding research, which leverages insights from cognitive science, linguistics, and computational modeling (cf. Nugraha, 2022, 2024a, 2025c; Pasaribu & Nugraha, 2020). These highly cited publications have had a significant influence on the development of the field, while shaping the understanding of the approaches and theoretical frameworks used in the analysis of compound words.

Scientific Output by Affiliation

Furthermore, it is also important to examine researcher affiliations. Figure 7 presents the distribution of scientific publications related to semantic research on compounding among fifteen different institutional affiliations. The data indicates a prominent concentration of research output originating from New York University, which recorded the highest number of publications, with a total of 12 documents. This dominance underscores the university's significant contribution to this field of study. Following this, Beijing Normal University and Kazan Federal University each show a strong presence with 8 documents. The University of Hong Kong contributed 7 documents, followed by 6 documents from an affiliation in the Hong Kong region, which indicates a substantial research focus in that area. The CNRS Centre National de la Recherche Scientifique and Eberhard Karls Universität Tübingen each recorded 5 documents, highlighting the consistency of research output from these European institutions. Meanwhile, The Education University of Hong Kong, Universita Wien, the University of Oxford, the University of Alberta, the Chinese University of Hong Kong, Università degli Studi di Milano-Bicocca, the University of Michigan, Ann Arbor, and the University of Cambridge each contributed 4 documents. The broad distribution of contributions across these various institutions underscores the global nature of academic interest and engagement in semantic research on compounding.

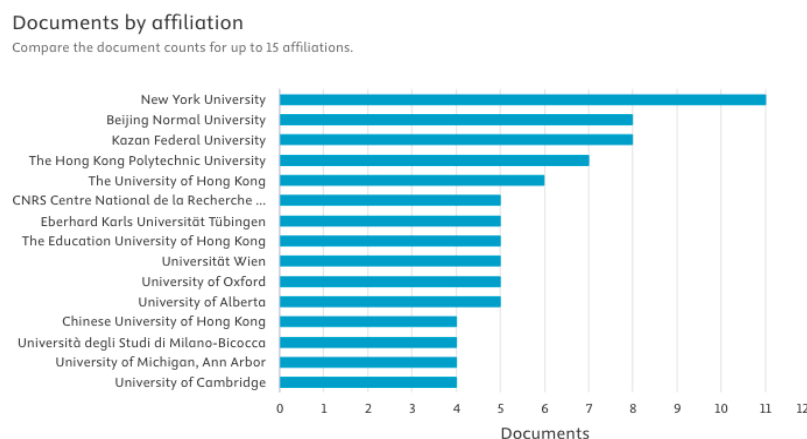


Figure 7. Scientific Output by Affiliation

Quantitatively, the average number of publications among these fifteen affiliations is approximately 6 documents. However, this average is heavily influenced by the high publication output of New York University, which indicates a skewed distribution. The median number of publications is 4, indicating that most institutions have contributed 4 documents or fewer. The range of publication counts, from 4 to 12 documents, underscores the variation in scientific output among different affiliations. Specifically, the contribution of New York University, which reaches

double the median value, shows a concentrated focus and sustained research interest in the semantics of compounding. The fact that a significant number of institutions (10 out of 15) have each contributed 4 documents reflects the presence of an institutional core actively involved in this field of linguistic study. Meanwhile, other institutions contributing between 5 and 8 documents demonstrate varying levels of engagement with the topic, which likely reflects differences in research focus or funding support.

Scientific Output by Researcher Nationality

Furthermore, Figure 8 illustrates the geographic distribution of scientific publications related to semantic research on compounding across fifteen different countries or regions. The data indicates a significant concentration of research output originating from the United States, which recorded the highest number of publications, exceeding 65 documents. This dominance underscores the substantial scientific contribution of the United States to the development of this field of study. Following this, China and the United Kingdom show a strong presence, with each contributing more than 25 documents. The Russian Federation, Spain, and Germany maintain a relatively consistent level of output, with each contributing more than 20 documents. Italy and Canada show a moderate level of contribution, with publication numbers exceeding 15 documents. Meanwhile, Hong Kong, the United Arab Emirates, Japan, South Korea, Sweden, Austria, and Greece each contributed fewer than 15 documents, indicating a lower but still significant level of engagement with this topic. Overall, the figure highlights the disparity in the distribution of research output among various countries and regions, which reflects differences in levels of focus and investment in semantic research on compounding.

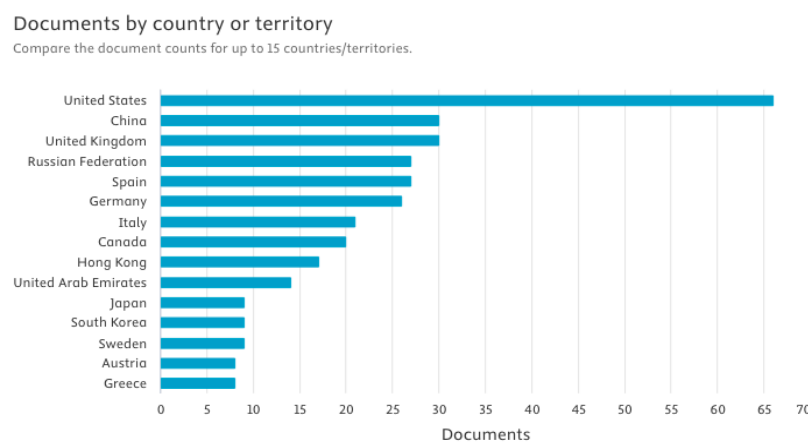


Figure 8. Scientific Output by Researcher Nationality

Quantitatively, the average number of publications among these fifteen countries or regions is approximately 24 documents. However, this average is heavily influenced by the high publication output from the United States, which indicates a skewed distribution. The median number of publications is approximately 20 documents, indicating that most countries have contributed 20 documents or fewer. The range of publication counts, from fewer than 10 to more than 65 documents, underscores the substantial variation in scientific output among different nationalities. Specifically, the contribution of the United States, which is nearly three times the average, demonstrates a concentrated focus and sustained research interest in the semantics of compounding. The fact that a significant number of countries (8 out of 15) have each contributed more than 15 documents reflects the presence of a core group of nations actively involved in this field of linguistic study. Meanwhile, other countries contributing fewer than 15 documents demonstrate varying levels of engagement with the topic, which likely reflects differences in research funding, academic focus, or priorities in linguistic research. Overall, these data underscore the importance of acknowledging the dominant contribution of the United States, while also appreciating the collective efforts of diverse countries in advancing research on the semantics of compounding.

Sponsored Research Output

In examining research funding, Figure 9 illustrates the distribution of scientific publications related to semantic research on compounding based on fifteen different funding sponsors. The data indicates a significant concentration of research output supported by the Deutsche Forschungsgemeinschaft, which recorded the highest number of publications, exceeding 12 documents. This dominance underscores the substantial role of the German research funding institution in promoting research in this field. Furthermore, the National Science Foundation and National Institutes of Health show a strong presence, with each supporting more than 10 documents, which highlights the significant investment from United States research institutions. The Social Sciences and Humanities Research Council and the European Commission each contributed approximately 8 documents, indicating a consistent level of support from these international bodies. Meanwhile, the Government of Canada, Japan Society for the Promotion of Science, U.S. Department of Health and Human Services, and Economic and Social Research Council each supported approximately 6 documents, reflecting a moderate level of funding. The European Regional Development Fund, European Research Council, Ministerio de Economía y Competitividad, National Institute on Deafness and Other Communication Disorders, National

Natural Science Foundation of China, and National Research Foundation of Korea each supported fewer than 6 documents, indicating a lower but still significant level of engagement with this topic.

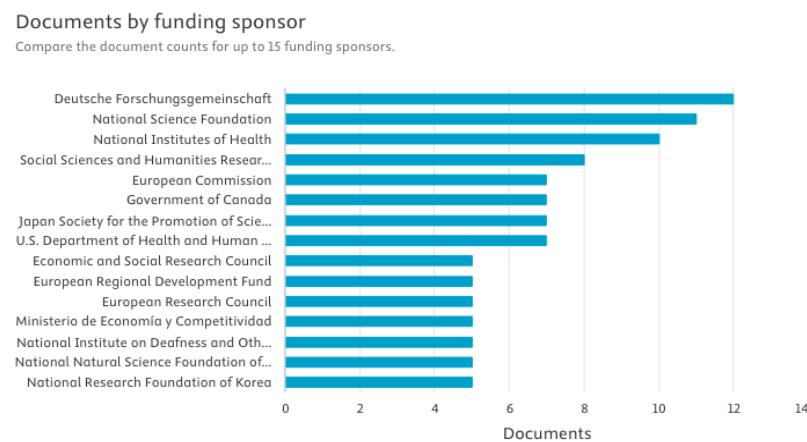


Figure 9. Sponsored Research Output

Quantitatively, the average number of publications among these fifteen funding sponsors is approximately 7 documents. However, this average is heavily influenced by the high publication output supported by the *Deutsche Forschungsgemeinschaft*, which indicates a skewed distribution. The median number of publications is approximately 6 documents, indicating that most sponsors have contributed 6 documents or fewer. The range of publication counts, from fewer than 4 to more than 12 documents, underscores the variation in sponsored research output among different funding bodies. Specifically, the contribution of the *Deutsche Forschungsgemeinschaft*, which is nearly double the average, shows a concentrated focus and sustained funding interest in the semantics of compounding. The fact that a significant number of sponsors (8 out of 15) have each supported more than 6 documents reflects the presence of a core group of funding agencies that actively support this field of linguistic study. Meanwhile, other sponsors contributing fewer than 6 documents demonstrate varying levels of funding commitment, which likely reflects differences in research priorities or funding strategies.

CONCLUSION

This study provides a data-driven overview of the semantic research landscape regarding compounding from 2014 to 2024. By analyzing a corpus of 376 publications from the Scopus database, we have successfully identified key thematic clusters, influential researchers, and significant publications, alongside several important bibliographic findings. These results offer insights into the evolution of the field, current trends, and the future direction of research. Our analysis shows that the study of compounding semantics is a

dynamic field, with an increasing emphasis on the development of theoretical frameworks and semantic analysis, alongside a sustained interest in the cognitive and developmental aspects of compounding. The identification of key researchers and institutions also highlights the collaborative nature of this field and the importance of interdisciplinary research efforts.

That said, this study acknowledges several limitations. The analysis only covers publications indexed in the Scopus database, which may potentially exclude relevant research published elsewhere. Furthermore, the reliance on keywords for thematic analysis may not fully capture the nuances and complexities of individual studies, while the quantitative approach used does not necessarily reflect the qualitative depth of these works. Therefore, future research could expand the scope of analysis by incorporating other databases and combining quantitative approaches with qualitative methods to obtain a richer and deeper understanding. Further research could also be directed toward exploring the impact of specific theoretical frameworks on compounding research, deepening the cognitive processes underlying the formation and interpretation of compound words, and examining cross-linguistic variations in compounding patterns.

DECLARATIONS

Not applicable

Use of artificial intelligence (AI)

Language refinement for this manuscript was supported by the use of Grammarly. The authors take full responsibility for the final text, ensuring that all tool-generated suggestions were critically evaluated and integrated at their discretion.

Conflict of Interest

The authors declare no conflicts of interest.

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