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Mapping the Knowledge Domain of Text Inferencing:
A Bibliometric Analysis

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ABSTRACT

Text inferencing is a critical factor that would affect discourse comprehension. Growing attention has been paid to the research on inferential processing during text reading, with numerous papers on this topic published in recent decades. To gain a bibliographic landscape of inferential processing during discourse reading, co-citation analysis, cluster interpretations, and citation bursts analysis were conducted via CiteSpace based on the data from the Web of Science (WoS) Core Collection of Thomson Reuters from 2001 to 2021. The results reveal that (1) reading comprehension and working memory are fairly popular topics in recent decades; (2) research exploring predictive inferences, bridging inferences, and causal inferences have been paid much attention; and (3) predictive inference, eye movement, and listening comprehension may be attractive in future studies.

KEYWORDS

Bibliometrics, CiteSpace, Inference Generation, Text Inferencing, Text Reading

As the "core of the understanding process" (Schank, 1976, p. 168), inferential processing plays an essential and pivotal role in successful comprehension during text reading (Virtue et al., 2006; Wang et al., 2021). Throughout the past few decades, inferential processing during discourse reading has been a major concern to researchers across disciplines such as linguistics, psychology, and neuroscience (e.g., Cohn, 2014; Perfetti & Stafura, 2013; Kim, 2014; Xu et al., 2020; Feng et al., 2021). Text inferencing has been defined as referring to the process by which readers cannot derive from the discourse directly and extract information from working or long-term memory to establish coherence between sentences of the discourse (Haviland & Clark, 1974). It is common for readers to generate a variety of inferences during the reading process (Graesser et al., 1994), and several major distinctions have been made according to different criteria (Seifert et al., 1985; Van den Broek et al., 2015, pp. 94-121). The distinction between predictive inferences and bridging inferences is one of them. According to the relationship between the information generated by inferences and the direction of reading process, inferences can be divided into predictive inferences (or forward causal inferences and forward inferences) and bridging inferences (or backward causal inferences,

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connecting inferences, backward inferences, and causal bridging inferences). With the former, readers are enabled to anticipate the incoming events of a text (Singer & Ferreira, 1983), whereas the latter has the function of establishing causal coherence between current information and prior text information (Singer et al., 1994). Additionally, in terms of the kind of knowledge required for inferences, inferences can be classified into text-based inferences and knowledge-based inferences. For example, anaphoric inferences can be called text-based inferences and causal inferences can be categorized as knowledge-based inferences. According to how text representation is constructed by them, inferences can be differentiated into necessary inferences and elaborative inferences. To be more specific, based on the richness of information, elaborative inferences can be sub-divided into connotation inferences and extension inferences. Depending on the distance of inferential processing, elaborative inferences can be sub-grouped into near inferences and far inferences. From the perspective of the time of inference generation, inferences can be grouped into inferences during reading and inferences after reading. It is worth noting that there are some other inferences that do not belong to any types mentioned above, and a case in point is thematic inferences.

Extensive and in-depth studies have been conducted on the cognitive processing of text inference and some influential theoretical models have been proposed to explain how inferences are processed during text reading from the perspectives of linguistics and cognitive psychology. Representative theoretical models include the constructionist model (Graesser et al., 1994), the minimalist hypothesis (McKoon & Ratcliff, 1992) and the current-state selection theory (Fletcher & Bloom, 1988). The constructionist model proposes that attempts are made by readers to construct meaningful situational models that highlight their objectives and demonstrate coherence as well as explain states, events, and actions in the passage. The minimalist hypothesis emphasizes the automatic minimal inferences that are not goal-specific and strategic without effort and working memory plays a significant role in inferential processes according to the current-state selection theory.

The factors that affect inferential processing in text comprehension have been investigated in previous studies and generally it is possible to categorize them into two groups: text-based factors and reader-based factors. One of the most influential text-based factors is contextual constraints. For example, Calvo (2000) examined how context constraints affected the way inferences were made during reading text. It was concluded that high constrained context could elicit earlier predictive inference generation. A study by Virtue et al. (2006) investigated the neural mechanisms involved in the generation of inferences and found that in the case of inferences implied in the text, the right superior temporal gyrus (STG) is activated, while when we have to generate inferences in order to comprehend the story, the left STG is activated, which reflects the vital significance of verbs in indicating text cohesion. Other text-based factors include textual complexity (e.g., Zanoli & Colombo, 2017; Swan & Walter, 2017), inference types (e.g., Cain et al., 2001; Bowyer-Crane & Snowling, 2005), etc. Meanwhile, a variety of reader-based factors also affect people's inference processing in text comprehension, such as age (e.g., Currie & Cain, 2015), working memory (e.g., Cain et al., 2004), inhibiting ability (e.g., Pérez et al., 2015), retrieval deficit (e.g., Yeari & Lantin, 2021), education level (e.g., Vilenius-Tuohimaa et al., 2008), and bilingual experience (e.g., Silverman et al., 2014). Among these factors, contribution of working memory to the inference generation during text reading catches more attention. For instance, Cook et al. (2001) investigated the conditions for triggering predictive inferences and their potential implementation. It was found that information generated by inferences may be stored in working memory instead of long-term memory. The information can be recalled easily but may be not retained in our memory for a long time.

As inferential processing during text reading has been investigated and explored, a wide range of theoretical and applied outputs have been produced in recent decades. It is of great necessity to clarify the current status of this field. However, there is a lack of bibliometric visual analysis of research on inferential processing during discourse reading in the disciplines of linguistics, psychology, and neuroscience. In view of this, based on the data from the Web of Science (WoS) Core Collection of Thomson Reuters from 2001 to 2021, this study attempts to conduct a visualized analysis on inference

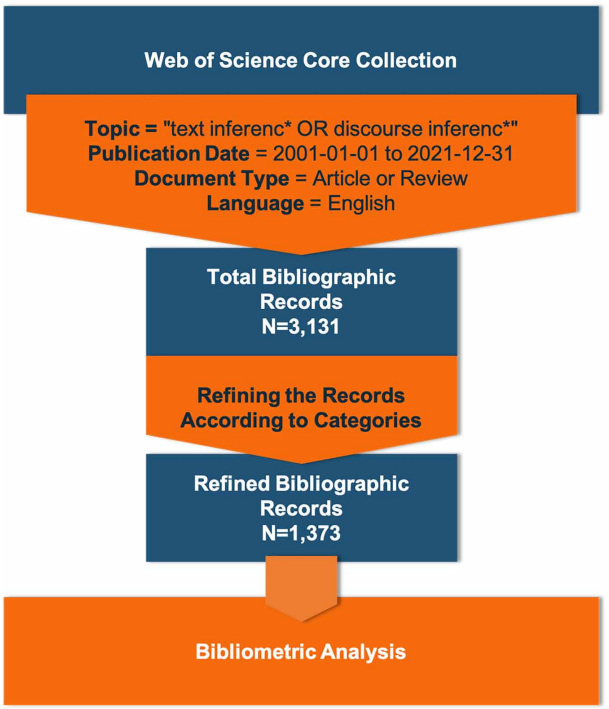
generation in discourse processing with the help of CiteSpace (6.1.R2). High-interest topics and thematic patterns in inferential processing during discourse reading are revealed to gain a macroscopic overview of text inferencing in the fields of linguistics, psychology, and neuroscience. Specifically, this investigation will address two primary research questions: (1) What is the current state of research in the field of text inferencin? and (2) What are the prevailing research trends in text inferencing?

METHODS

Data Collection

A bibliometric analysis is a systematic approach that employs computer-assisted techniques to identify the core research or authors, and their relationships by scrutinizing publications pertaining to a particular topic or field (De Bellis, 2009). The two primary databases utilized for bibliometric analysis are Web of Science (WOS) and Scopus (Singh et al., 2021). Although both databases are widely used, WOS is known for its more stringent standards and has a 99.11% overlap with Scopus in terms of indexed journals (Singh et al., 2021). Consequently, the published papers on inference processing in discourse comprehension during 2001-2021 were collected from the WoS Core Collection, consisting of Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Arts and Humanities Citation Index (A and HCI), Conference Proceedings Citation Index-Science (CPCI-S), Conference Proceedings Citation Index Social Science and Humanities (CPCI-SSH) as well as Emerging Sources Citation Index (ESCI). All collected bibliographic records were written in English. The search strategy and the inclusion criteria were detailed in Figure 1. The selection of search terms for this study is informed by the bibliometric analysis of lexical inferencing conducted by Yang et al. (2023). A total of 3,131 records were obtained from 1,306 journals distributed in 200 WoS categories. The current research attempted to focus on inference processing during text reading

Figure 1. The flowchart of the search strategy and selection process in this study



from the perspectives of linguistics, psychology, and neuroscience. As a result, 1,373 articles were extracted, and the categories involved are shown in Figure 2. Among the 16 categories, Linguistics, Psychology Experimental, Psychology Educational, and Language Linguistics involve the most articles, each accounting for more than 20 percent.

Instrument

The CiteSpace software program is a free Java application that analyzes and visualizes the literature of a specified scientific or knowledge domain, providing a visual gateway to the literature of scholarly publications. The program generates interactive visualizations from bibliographic information, particularly citation data from the WoS, which allows users to navigate and explore patterns and trends uncovered in scientific publications (Chen, 2006).

In this study, the knowledge domain associated with inference processing during text reading in the framework of linguistics, psychology, and neuroscience was explored to reveal critical references, identify research patterns and hotspots to predict emerging trends in the literature.

RESULTS

Publication Years and Journals

Figure 3 illustrates the annual publications during the years 2001-2021. The research outputs on inference processing during discourse reading showed a fluctuating increase. Based on its annual publications, text inferencing research can be broadly divided into two periods. The first period, 2001-2011, demonstrated a slow growth, with the number of papers published per year remaining below 100. The second period, 2010-2020, indicated a rapid development, with the number of articles published in 2019-2021 being more than 100 each year.

The results showed that studies on inference generation in text comprehension have captured the interest of scholars in several domains, with 376 journals in total contributing to inferential processing during text reading. Table 1 listed the top 10 journals in number of publication and

Figure 2. The categories involved in this study

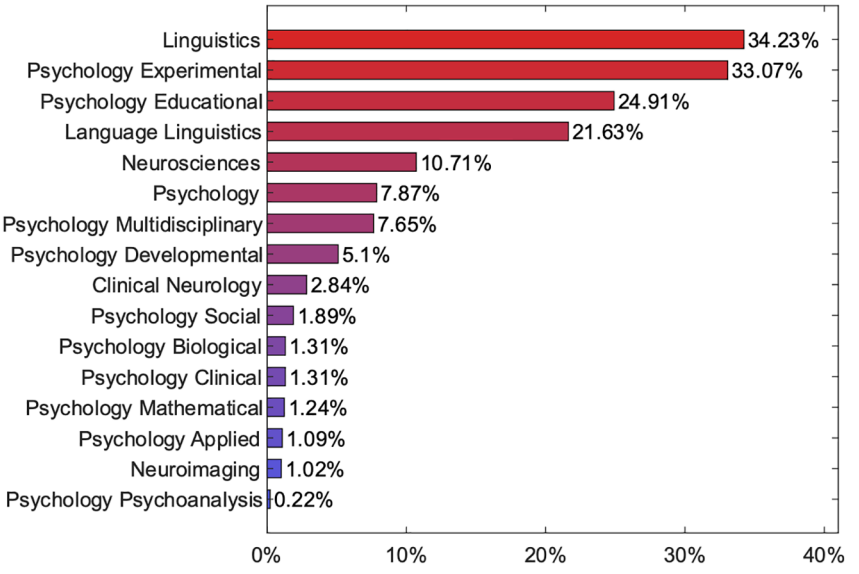


Figure 3. Annual publications of research on inferential processing during text reading in WoS

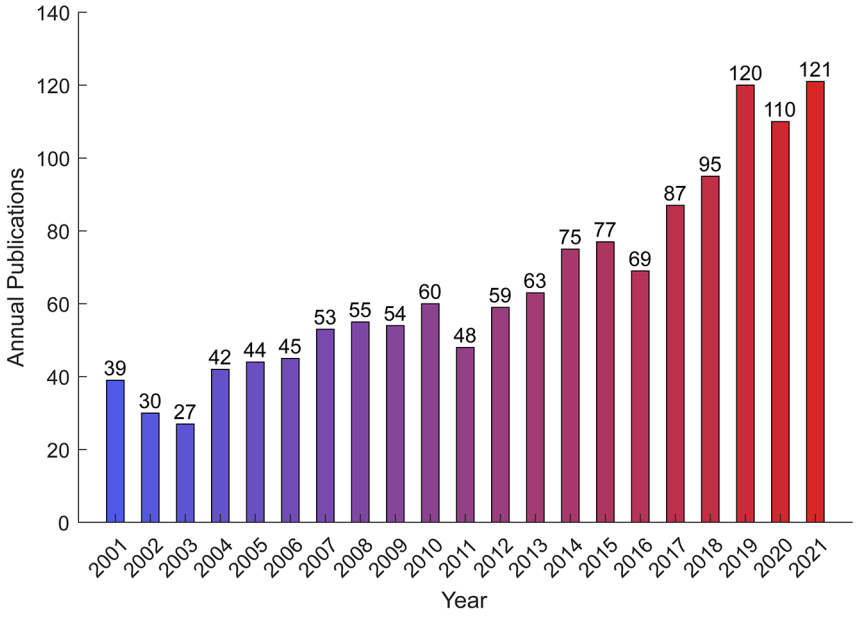


Table 1. The top 10 journals and cited journals contributed to text inferencing

Rank	Journal	Publications	Cited Journal	Citation Times
1	Discourse Processes	94	Psychological Review	695
2	Journal of Pragmatics	49	Discourse Processes	654
3	Memory and Cognition	39	Journal of Memory and Language	634
4	Journal of Educational Psychology	33	Memory and Cognition	595
5	Reading and Writing	31	Journal of Experimental Psychology - Learning Memory and Cognition	566
6	Frontiers in Psychology	29	Educational Psychology	497
7	Brain and Language	23	Psychological Bulletin	416
8	Journal of Experimental Psychology - Learning Memory and Cognition	21	Journal of Memory and Language	384
9	Journal of Memory and Language	21	Psychological Science	366
10	Reading Research Quarterly	20	Cognition	350

number of citation counts from 2001 to 2021. It can be seen that Discourse Processes was the journal publishing the largest number of papers (n=94), followed by Journal of Pragmatics (n=49), Memory and Cognition (n=39), and Journal of Educational Psychology (n=33). In addition, the co-citation analysis of journals showed that Psychological Review held the highest co-citation counts (n=695), followed by Discourse Processes (n=654), Journal of Memory and Language (n=634), and Memory

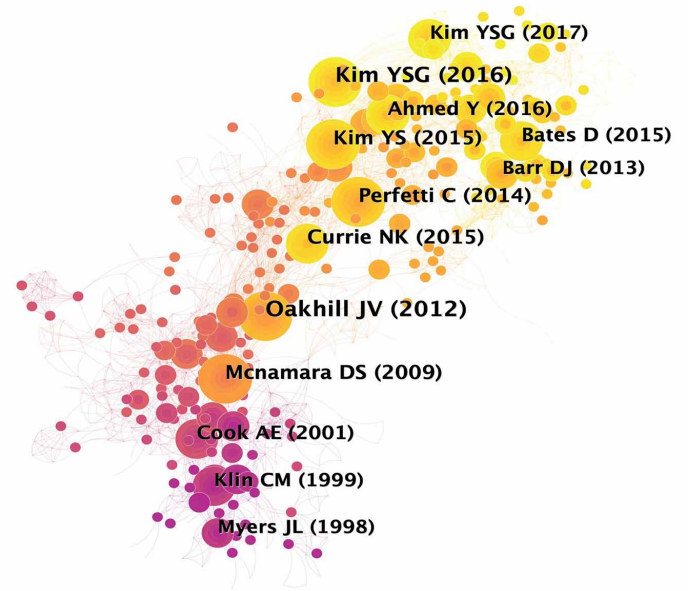
and Cognition (n=595). These journals may be helpful to gain a knowledge of studies in the field of inference processing in text comprehension.

Document Co-Citation Analysis

The 1,373 bibliographic records from 2001 to 2021 were visualized by CiteSpace, and a three-year time slice was chosen for analysis, generating the document co-citation network as represented in Figure 4. There are 952 nodes and 3,512 links emerged in this document co-citation network, representing the most cited references and co-citation relationships from 2001 to 2021. These highly cited papers show significant impact on the development of inference generation in discourse processing.

The most cited article was written by Perfetti and Stafura (2013). In this article, they proposed the Reading Systems Framework, a wide-angle perspective of reading comprehension. In addition to studies of memory, inferences, and mental models, the framework made central the role of the lexicon in understanding components of comprehension. The second most cited paper is the research article of McNamara and Magliano (2009, pp. 297-384). They described, evaluated, and compared seven prominent comprehension models, i.e., Construction-Integration, Structure-Building, Resonance, Event-Indexing, Causal Network, Constructionist, and Landscape, which led to the development of a more comprehensive model of reading comprehension. They concluded that current models of comprehension covered a different spectrum of comprehension processes, and their applicable range was too limited without accounting for a wide variety of reading situations. The work of Oakhill and Cain (2012) is the third most cited article, which looked into the factors that influence reading comprehension and accuracy. It was found that reading comprehension performance was influenced by inference, comprehension monitoring, world knowledge, and story structure. Early assessments of word reading accuracy and phonemic awareness were predictive of later performance in word reading accuracy. The fourth most cited article is Kim (2016). Kim (2016) looked at the direct and mediated effects on participants' listening comprehension performance of foundational cognitive abilities, foundational language abilities, and higher-order cognitive abilities. It was found that listening comprehension was directly and indirectly influenced by multiple language and cognitive abilities.

Figure 4. Key articles in the field of inferential processing during text reading



The fifth most cited article is Kim (2014). In this study, Kim (2014) investigated the connections between listening comprehension performance low-level linguistic and cognitive abilities and high-level cognitive abilities by multivariate analysis of experimental data from Korean children. It was found that low-level abilities predicted children's comprehension monitoring and theory of mind, which in turn predicted their performance of listening comprehension. Furthermore, working memory, vocabulary, and syntactic understanding in children were all directly or indirectly connected to how well they performed in listening comprehension, comprehension monitoring, as well as the theory of mind. In conclusion, listening comprehension and word reading were mediators of reading comprehension.

Interpretation of Clusters

Figure 5 and Figure 6 demonstrate a cluster view and a timeline view for the knowledge domain of inference processing in text comprehension generated by the whole collection of 1,373 bibliographic

Figure 5. Cluster view of inferential processing during text reading

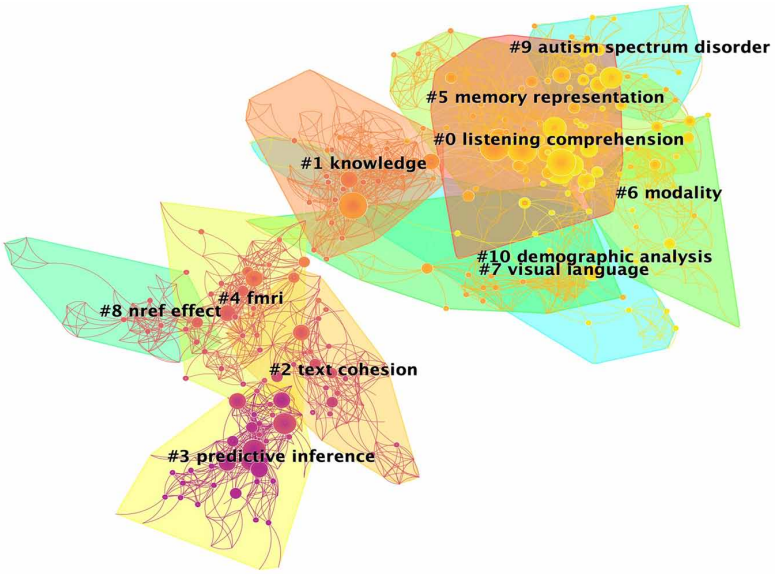
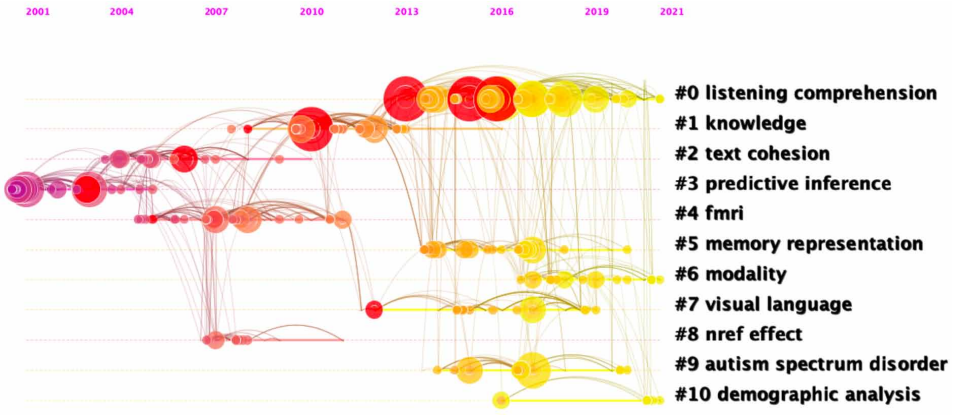


Figure 6. Timeline view of the knowledge domain of inferential processing during text reading



records, indicating the inter-connectivity among nodes of the clusters and the time span in a certain cluster in the duration of 2001-2021. It can be seen that there are dark dots presented in Cluster #0, Cluster #1, Cluster #2, Cluster #3, Cluster #4 and Cluster #7, which means these six clusters contributed the most citations to the knowledge domain during 2001-2021.

Cluster #0 is labeled as listening comprehension, with increased emphasis on the elements influencing reading and listening comprehension. The top 3 cited papers in this cluster include Oakhill and Cain (2012), Kim (2016), and Perfetti and Stafura (2013). The investigation conducted by Oakhill and Cain (2012) suggested that reading comprehension performance was predicted by inference, comprehension monitoring, world knowledge, and story structure. In terms of word reading accuracy, early assessments of accuracy and phonemic awareness correlated with later performance. Kim (2016) examined direct and mediated effects of foundational cognitive abilities, foundational language abilities, and higher-order cognitive abilities to listening comprehension. The higher-order cognitive abilities included inference, theory of mind, and comprehension monitoring. It was found that multiple linguistic and cognitive abilities make both direct and indirect contributions to listening comprehension performance. Perfetti and Stafura (2013) put forward the Reading Systems Framework which placed the role of the lexicon in the center and contributed to the study of the role of memory, inference, and mental model updating in comprehension. To sum up, the articles in this cluster concentrate more on the role of influencing factors in inference processing in discourse comprehension.

Cluster #1 is labeled as knowledge, which means that researchers attach much significance to basic knowledge such as theoretical models when considering issues of inferential processing during text reading. The highly cited articles in this cluster include McNamara and Magliano (2009, pp. 297-384), Kendeou et al. (2009), and Cromley and Azevedo (2007). McNamara and Magliano (2009, pp. 297-384) held the view that the applicable range of current comprehension models was too limited, without taking a wide variety of reading situations into consideration. Therefore, seven prominent comprehension models were described in McNamara and Magliano (2009, pp. 297-384) to lay the groundwork for the development of a more comprehensive reading comprehension model. By using structural equation modeling, Kendeou et al. (2009) investigated oral language development from preschool to early elementary school. It was concluded that both oral language and decoding abilities developed early in children's lives and made a contribution to reading comprehension. Cromley and Azevedo (2007) introduced the direct and inferential mediation (DIME) model which is a model of reading comprehension. The model showed the direct and mediated effects of five predictors including background knowledge, inferential ability, reading comprehension strategies, vocabulary knowledge, and word reading on reading comprehension process. It was found that the most significant contributions to reading comprehension were vocabulary and background knowledge, followed by inferential ability, and reading strategies.

Cluster #2 is labeled as text cohesion, which is an essentially influential factor of text inferencing contributing to reading comprehension. The most cited papers in this cluster include Van den Broek et al. (2005), Linderholm and Van den Broek (2002), and Van den Broek et al. (2001). Van den Broek et al. (2005) insisted that a comprehensive theory of reading comprehension should encompass both memory-based process and constructionist approach. Using the Landscape Model, they presented a conceptual framework where memory-based processes and constructionist approaches interact dynamically in reading comprehension performance. Linderholm and Van den Broek (2002) examined how readers with different working memory capacities adjusted cognitive processes to fit the reading purpose. It was found that readers changed their processing to suit their reading objectives. Reading for study requires the least processing resources for readers with low working memory capacity. According to Van den Broek et al. (2001), readers' goals influence their ability to generate inferences and remember expository texts. It was found that more coherence-building inferences generated when readers had a study goal while associations and evaluations were more likely to occur when readers had an entertainment goal. The result showed that inference generation during reading was partially strategic and reading goals and inference generation affected each other.

Cluster #3 is labeled as predictive inference, which is one of the common types of inferences during reading that attracted many researchers' attention. The highly cited articles in this cluster include Cook et al. (2001), Klin et al. (1999), and Myers and O'Brien (1998). Cook et al. (2001) have evidenced that, from the point of memory-based view, a constraining context may appear anywhere in a passage if it is readily available. Additionally, in spite of the fact that predictive inferences may be activated, they may not actually be embedded in the long-term memory representation of a text. The persistence of predictive inferences in memory was explored by Klin et al. (1999). Their findings can be concluded into following points. First, readers would generate predictive inferences when the passage context was quite limited. Second, predictive inferences made from contexts would disappear when a second consequence was added. Third, there was no significant effect of passage length alone on the generation of predictive inferences. Fourth, long-term memory representation had an influence on readers' predictive inferences. As a result of examining several variables, Myers and O'Brien (1998) described a numerical model of the hypothesized resonance mechanism with some applications.

Cluster #4 is labeled as fMRI, which means that fMRI technique is frequently adopted by researchers when exploring inferential processing during text reading. The most cited articles in this cluster include Ferstl et al. (2005), Virtue et al. (2006), and Mason and Just (2004). Ferstl et al. (2005) adopted the fMRI technique to investigate the neurologic correlation of narrative comprehension. It was revealed that an activation of the ventromedial prefrontal cortex and the extended amygdaloid complex was triggered by emotional information. In addition, the integration of inconsistent temporal information activated the lateral prefrontal cortex bilaterally, the integration of inconsistent emotional information activated the dorsal front medial cortex. The results indicated that there was a significant role played by the right hemisphere in language processing in context, as well as the left medial and bilateral prefrontal cortices. Virtue et al. (2006) examined the neural mechanisms that underlay inference generation with the help of fMRI. The results suggested that when individuals generated inferences, areas within STG and inferior frontal gyrus (IFG) were heavily recruited. Meanwhile, the right hemisphere STG was specifically involved during early inferential processing, whereas the left hemisphere STG was particularly involved during later one when comprehending stories. Mason and Just (2004) proposed that it was possible to categorize the inference process into generation and integration, which were supported by systems in the dorsolateral prefrontal cortex (DLPFC) and the right-hemisphere language areas that could be distinguished from the traditional left-hemisphere reasoning systems.

Cluster #7 is labeled as visual language, which means that the research which is related to inference generation during text reading has been extended to multimodal studies such as vision and auditory instead of limiting to auditory language. The top 3 cited papers in this cluster include Magliano et al. (2015), Kutas and Federmeier (2011), and Cohn (2014). While viewers comprehended visual narratives, Magliano et al. (2015) investigated how visuospatial versus linguistic working memory contributed to bridging inference generation online. It was determined that both visuospatial and linguistic working memory assisted inference formation in visual narratives. Kutas and Federmeier (2011) investigated how a wide variety of stimulus types elicit the N400, an event-related brain potential (ERP) associated with language comprehension, and outlined the how the N400 amplitude responded to linguistic and nonlinguistic manipulations. The validity of narrative categories was tested by Cohn (2014) in four experiments. It was found that diagnostic tests can identify trends in their distribution through a sequence, as proposed by the theory of "Visual Narrative Grammar".

There are other clusters in this knowledge domain that are noteworthy. #5 memory representation demonstrates that inference processing during discourse reading is always instantiated into the texts' memory representation, including working memory representation and long-term memory representation. #6 modality represents researchers' focus on modality-specific factors influencing inference processing in discourse comprehension (e.g., Spunt & Lieberman, 2012; Wolf et al., 2019). #8 nref effect means that some researchers attempted to explore the Nref effect in inferential processing

during text reading. For instance, Nieuwland and van Berkum (2008) found that ambiguous anaphors elicited a lasting Nref effect when exploring anaphoric inferencing. #9 autism spectrum disorder indicates that the inferential processing mechanisms of exceptional individuals, such as people with autism spectrum disorder, during text reading have also received attention from researchers (e.g., Bodner et al., 2015). #10 demographic analysis means some researchers perform demographic analysis with the consideration of social and linguistic factors when examining inferential processing during discourse comprehension (e.g., Fernandez de Landa & Agerri, 2021).

The Hot Topics for Inferential Processing During Text Reading

Research hotspots within a particular field of research can be identified by high frequency terms (Chen, 2004). Figure 7 displayed the keyword network of inferential processing during text reading, which can be used to reveal the main topic in the relevant field. The top ten co-occuring terms that co-occur frequently and have a high betweenness centrality in inference generation in discourse comprehension were presented in Table 2. It can be seen that "inference" was the most frequent keyword, with the frequency of 278, followed by "comprehension", "memory", "knowledge", and "text comprehension", with the frequency of 241, 213, 201, and 198 respectively. In addition, "reading comprehension" held the highest betweenness centrality which was 1.10, followed by "individual difference", "time course", "narrative text", and "skill", with the betweenness centrality of 0.83, 0.81, 0.42, and 0.35.

An emerging research trend can be detected by using citation bursts in a certain knowledge domain (Chen, 2006; Guo, 2017). Based on the data collected, the top 20 keywords with the strongest citation bursts have been revealed with the help of CiteSpace, as shown in Table 3. Among these keywords, "predictive inference" had the strongest strength of burst, followed by "time course", "right hemisphere" and "narrative text". From the perspective of inferential types, "predictive inference" and "bridging inference" had the strongest citation burst, with the strength of 8.48 and 3.53. As for textual types, "narrative text" and "expository text" had the strongest strength which was 7.65 and 4.05. In addition, eye movement was the one that had the greatest potential, with the strength of 6.15 when it comes to research techniques. In terms of co-cited references, Oakhill and Cain (2012) had the strongest citation burst, followed by McNamara and Magliano (2009, pp. 297-384), Perfetti and Stafura (2013) and Schmalhofer et al. (2002), with strength more than 8.

Figure 7. Keyword network of inferential processing during text reading

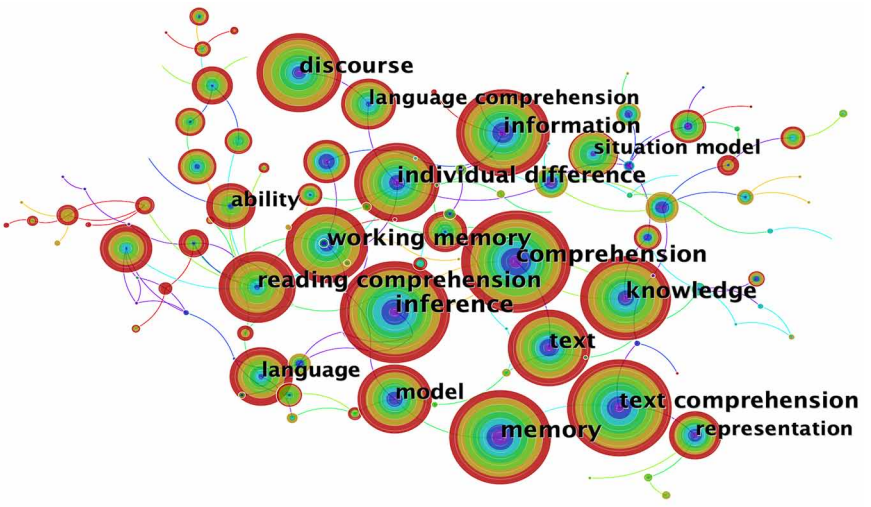


Table 2. The top 10 co-occurring terms with high frequency and high betweenness centrality in inferential processing during text reading

Rank	Terms	Frequency	Terms	Betweenness Centrality
1	inference	278	reading comprehension	1.10
2	comprehension	241	individual difference	0.83
3	memory	213	time course	0.81
4	knowledge	201	narrative text	0.42
5	text comprehension	198	skill	0.35
6	reading comprehension	193	predictive inference	0.34
7	working memory	183	expository text	0.29
8	individual difference	177	integration	0.24
9	text	176	communication	0.23
10	information	172	prior knowledge	0.22

Table 3. Top 20 keywords with the strongest citation burst

Keywords	Citation Bursts			
	Strength	Begin	End	Duration
predictive inference	8.48	2001	2009	
time course	8.23	2001	2005	
right hemisphere	7.99	2001	2012	
narrative text	7.65	2001	2005	
eye movement	6.15	2016	2021	
listening comprehension	5.5	2015	2021	
retrieval	5.22	2001	2006	
recall	4.93	2002	2010	
suppression	4.68	2005	2011	
narrative comprehension	4.61	2010	2014	
simple view	4.49	2016	2021	
sentence	4.32	2007	2012	
perspective	4.26	2014	2018	
mind	4.06	2011	2016	
expository text	4.05	2015	2019	
availability	3.88	2001	2005	
theory of mind	3.68	2011	2016	
bridging inference	3.53	2004	2008	
task	3.47	2012	2017	
accessibility	3.45	2004	2014	

The keywords with the strongest citation burst with an end year of or near 2021 suggest that their citation bursts may probably continue, representing emerging trends in the future. It can be found that applying eye movement to the studies of inferential processing during discourse reading has been attracting an increasing number of researchers' attention. Additionally, recent studies have been trying to explore inferential processing during listening comprehension. Furthermore, the simple view has been used on inferential processing during text reading. At the same time, researchers have been trying to expand the types of experimental texts, such as exploring inferential processing in expository text comprehension.

DISCUSSION

In the present study, 1,373 bibliometric records on text inferencing ranging from 2001 to 2021 were collected and CiteSpace was adopted to visually and quantitatively analyze these data retrieved from the WoS. Based on the results of co-citation analysis, cluster interpretations, and keyword analysis generated by CiteSpace, it can be seen that: (1) the results of document co-citation analysis reveal that research on inference processing during text comprehension attracted much attention in the fields of linguistics, psychology, and neuroscience during the period of 2001-2021. Particularly, reading comprehension and listening comprehension are popular topics in studies on inferential processing during text reading. (2) The results of cluster analysis suggest that the largest clusters are #0 listening comprehension, followed by #1 knowledge, #2 text cohesion, #3 predictive inference, and #4 fmri, all belonging to the clusters with the strongest citation bursts in the knowledge domain. (3) The results of keyword analysis indicate that reading comprehension, working memory, etc. are hot topics in the field of inferential processing during text reading. Additionally, predictive inference, eye movement, listening comprehension, etc. may probably be the research trend in future studies.

The type of inferencing is an important factor influencing the inferential processing. The cognitive resources involved in different types of inferences may differ from one to another. For example, Beeman et al. (2000) distinguished the difference between the processing of predictive inferences and coherence inferences. They found that participants generated predictive inferences only when target words displayed to the left visual field-Right Hemisphere (lvf-RH), while generated coherence inferences only if target words displayed to the right visual field-Left Hemisphere (rvf-LH). With regard to types of inferences involved in inference generation during discourse reading, predictive inferences (e.g., Schmalhofer et al., 2002; Calvo 2000; Calvo et al. 2006), bridging inferences (e.g., Schmalhofer et al., 2002) and causal inferences (e.g., Mason & Just, 2004; Kuperberg et al., 2006) have been paid much attention. Schmalhofer et al. (2002) proposed a unified model for the generation of predictive and bridging inferences. According to the model, inferences may be generated and represented at the situational level, as opposed to explicit statements and multilevel representations keep inferences and explicit statements together rather than depending on an independent strength value for each unit of knowledge. Calvo (2000) investigated how context constraints affect predictive inferences during discourse reading and arrived at the conclusion that strongly constrained texts generated predictive inferencing earlier than weakly constrained ones. Calvo et al. (2006) researched on how reading strategies affected predictive inferences. It was suggested that specific goals in reading could result in the generation of predictive inferences earlier, and Inferences might be generated without requiring explicit information to be comprehended. The fMRI-based study of Mason and Just (2004) suggested that two components are involved in the processing of inferencing, generation served by the reasoning system in dorsolateral prefrontal cortex, and integration served by the language areas in the right-hemisphere. An analysis of neural activity mediating causal inferences under three-sentence texts was conducted by Kuperberg et al. (2006). It was found that causal inference involved activating, retrieving, and integrating information from long-term semantic memory.

In terms of text genres, the most frequent text genre concerned is narrative text (e.g., Rapp & Kendeou, 2007; Cohn, 2014). Readers' revisions of trait-based models of story characters during

narrative comprehension are influenced by a number of factors, according to Rapp and Kendeou (2007). It was demonstrated by Cohn (2014) that categorical roles interact with a global narrative structure. Clinton et al. (2020) provided an overview via performing a meta-analysis of the results of inferential processing incorporating texts of different genres, i.e., expository texts and narrative texts. It was found that inferential processing during reading expository texts was more difficult than reading narrative texts. The finding showed that text genres were also supposed to be taken into consideration when addressing issues of inference generation in text processing.

When it comes to techniques used in studies on inferential processing during discourse reading, fMRI (e.g., Kuperberg et al., 2006) and ERP (e.g., Kutas & Federmeier, 2011) may be choices for researchers when empirical experiments are involved. Actually, eye tracking is also an available research tool to investigate reading issues. It monitors and measures eye movements to determine readers' fixation, saccade and regression in the area of interest (AOI), so as to understand how we attend to and process the visual information, which may shed light on various cognitive processes underlying different behaviors of human beings.

CONCLUSION AND FUTURE WORK

To our knowledge, the present study has been the first attempt to provide a quantitative inspection of inferential generation during text reading by adopting a bibliometric approach. The results reveal that: (1) reading comprehension and working memory are fairly popular topics in recent decades; (2) research exploring predictive inferences, bridging inferences and causal inferences have been paid much attention; (3) predictive inference, eye movement, and listening comprehension may be attractive in future studies.

Future studies on inferential processing in text comprehension can be considered from the following four perspectives. First, two aspects should be noted from the perspective of stimulus material. For one thing, the majority of studies examined inferential processing of compiled short texts such as two-sentence passages (e.g. Mason & Just, 2004), which were different from what actually happens when readers are faced with real discourse and could hardly reflect the comprehensive characteristics of inference generation during discourse reading. It is advisable to adopt longer and more naturalistic discourse stimuli in future research. For another, few studies have focused on the comparison of inferential processing of various types of inferences and different text genres. In order to examine the similarities and differences among various types of inferences and text in future research, attention allocation should be controlled. Second, in terms of participant selection, previous studies focused more on adults, while little focus has been placed on children. The ability to generate inference during text reading plays an important role in language learners' comprehension of text meaning and constructing the comprehensive representation of text. Hence, more importance should be attached to children in future studies so as to provide vital implications for language teaching and language learning. Additionally, the research results of some studies are waiting to be further substantiated by investigation with larger samples and participants from other population groups. Another point worth noting is that the interaction between different reader-based factors and text-based factors deserves further empirical research in inference generation in discourse processing. Third, when it comes to research techniques, previous researchers used fMRI more frequently, which is involved in the clusters with the strongest citation bursts in the knowledge domain of inferential processing during text reading (Figure 6). However, the benefits of different techniques vary from one to another. The ERP technique provides a high temporal resolution, whereas fMRI offers a high spatial resolution. Positron Emission Tomography (PET) is capable of detecting areas of molecular biology detail, and eye tracking could specifically monitor readers' eye movements during reading. Therefore, cross-validation by the adoption of various techniques and more elaborated methods such as ERP and fMRI would be beneficial for researchers to gain a more multidimensional understanding of the dynamic cognitive processing of inferential processing during text reading. Fourth, the current research on

inference processing during discourse reading is mainly monolingual studies. Multilingual research on inference generation in text processing across languages is still waiting to be conducted.

Admittedly, there exist some limitations in the bibliometric analysis. For example, the landscape constructed by CiteSpace is still sparse due to a lack of literature from a certain time span and non-English databases. In addition, it is universally acknowledged that the principle of a bibliometric analysis conducted by CiteSpace is keyword frequency and citation counts, so self-citation may lead to potential bias. Nonetheless, there is still a great deal of interest among academics in it. As opposed to conventional approaches, which require scholars to contextualize certain studies subjectively, readers can see structural and temporal patterns and trends in a particular knowledge domain through document co-citation analysis. (Trujillo & Long, 2018; Liu et al., 2021). Therefore, it should be noted that the present study presented an overview of the current status, research patterns, and hotspots of research on inference processing during text comprehension from 2001 to 2021 and indicated potential trends for future research. Thus, it is reasonable to conclude that the current bibliometric analysis of inferential processing in text comprehension will be beneficial for the researchers in relevant fields.

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