

# Discourse Synthesis: The Structure of Knowledge Production

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This edited collection crowns the academic undertaking Raymond G. McInnis took to his heart in 1978, with the publication of his *New Perspectives for Reference Services in Academic Libraries* (Westport, CT: Greenwood Press, 1978. xxiv + 251 pp. Contributions in Librarianship and Information Science, 23). He recently advanced this project by editing a special issue of *Social Epistemology* (vol. 10, no. 1, 1996), in which he assembled most of the present contributors around the topic of discourse synthesis and social epistemology. At first glance, this work's heading – *Discourse Synthesis: Studies in Historical and Contemporary Social Epistemology* – could suggest just another title in the blooming theme of 'discourse analysis', an area of discourse (and text) linguistics developed almost coterminous with McInnis project in the last three decades. However, these two 'methodologies' (as the terms 'analysis/synthesis' suggest) may be described as the two faces of the same coin. They may be complementary for the attainment of an identical purpose, but they depart each from opposing orientations. While 'analysis' deals with the formal building-up of discourses, 'synthesis' elaborates on the content of discourses, with the aim of their content summarisation and integration.

## 1. 'New logic', discourse synthesis and social epistemology

At the start of his endeavour, McInnis attests, he thought that the library profession 'needed a treatise that explained how academic librarianship related to the new thinking on epistemology, especially new and exciting developments in the history and philosophy of science' (p. 9). The end result is this volume that McInnis edits, presiding over a number of collaborators taking their turn to report the results of discourse synthesis in different scientific fields. Hence, this book's subtitle, specifying that these are *Studies in Historical 'Social Epistemology'* (a 'discipline' Jesse Hauk Shera [1903–1982] proposed since 1952, but was unheard by his library 'discourse community'), and *Contemporary 'Social Epistemology'* (a term coined

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independently by Steve Fuller [1959– ], in an article when *Synthese* [vol. 73, no. 1, October 1987] published a special issue on the subject). Soon afterwards, Fuller published a first book with the title *Social Epistemology* (Bloomington: Indiana University Press, 1988. xv + 316 pp.)

McInnis asserts that discourse synthesis shares the same vocabulary of the seventeenth century emerging ‘New Logic’ (Bacon’s *Novum Organon*). From the vocabulary of the New Logic, the terms ‘consensus’ and ‘concept’ most appropriately disclose the social feature of scientific enquiry, and of the social character of knowledge construction. To understand the nature of inquiry in a particular discipline, or ‘discourse community’, one has to look at the ‘social dimensions’ of the enterprise: the quality of personal craftsmanship and community affiliation. What are the required common standards and norms? What is the appropriate ‘craft quality’ (personal autonomy and responsibility) required from members? Actors in a discourse community work towards an agreement upon what subject matter, how and with what evidence, resulting in what valid claims in discourse are there for investigation and explanation?

## 2. *Reaching consensus inside the ‘limits of knowledge’*

These standards and norms of scholarship undergo a lengthy process, and agreement is not reached orderly and peacefully. To reach a new understanding, a discourse community is subject to its ‘limits of knowledge’. To explain the origin of new knowledge or new concepts, McInnis uses the ‘generative model’: concepts are the ‘agreed-upon theoretical principles’ obtained through the process of scholarship (seeking to understand a subject matter, producing a body of knowledge, publishing research findings . . .) These concepts exert the function of identification, classification, association and definition of topics. They receive a ‘prescribed’ meaning when created, and then they may change their meaning, and may come to be applied interdisciplinary across boundaries. Concepts have been characterised as ‘building blocks of knowledge’, so that (abstract) knowledge can be ‘visualised’ and ‘manipulated’ in an easier way. McInnis borrowed from a variety of thinkers the ‘generative model’ to explain the changes in the cognitive (thinking) and epistemological (discourse) processes, propelled by the New Logic. This model advocates that humans can by themselves understand the world, and implies that every society has its ‘limits of knowledge’ to create their schemata of experience, which can occur only within the intellectual horizon of its epoch. New concepts acquire meaning through metaphorical transformation, while related to something already known. We could add here that the term ‘concept’ is itself a biological analog for ‘that which is conceived’. (Remember ‘maieutiké tékne’, the midwife craft metaphor Socrates used to explain the art of extracting from others the ‘ideas’ inherent in their minds.) Thus, most metaphors are created by common sense and later appropriated by science. In fact – we could also add – knowing by metaphor was the only source of knowledge before the ancient Greek philosophers devised a new mode of reasoning.

The metaphor of concepts as ‘building blocks of knowledge’ is not new, since John Locke (1632–1704) already spoke of packaging ‘ideas’ into ‘bundles’, so that they can be treated as physical objects of experience. Ephraim Chambers, the dictionary maker, and William Hamilton, the British philosopher, followed suit.

McInnis contends that Locke's metaphor was criticised by Gottfried Wilhelm Leibniz (1646–1716) for what he thought was an imprecise definition of 'idea', not for the metaphor itself. It took the work of Immanuel Kant (1724–1824) to sort out the confusion surrounding 'idea', 'concept', and 'Begriff'. Kant's influence can be traced to Samuel Taylor Coleridge (1772–1834), who drove the German romantic theory into Britain, and to poet Edward Young (1683–1765), who claimed the concept of 'author' could be grounded, not in an empiricist tradition, but in an 'organic' element as the generative component of originality, an idea Johann Gottlieb Fichte (1762–1814), a student of Kant, brought back to Germany. 'Without a concept of copyright to legitimate the idea that a written text is a unique creation, English romantic literary theory would not have been of firm enough ground to be convincing', due to the then 'limits of knowledge' in the British society (p. 5).

### 3. *Discourse synthesis and concept creation*

Locke's characterization of concepts as 'bundles' emerged almost a century after the appearance of the *Transactions* of the Royal Society. His empiricist psychological theory argued that the mind seeks to make knowledge, that is, understanding and explanation, by actively integrating sense data from previous perceptions. The human mind works to make sense of data, by classifying, comparing, building associations of data, into comprehensible pictures. Thus, 'concept' and 'symbolic representation' can be interchangeable to describe the coherence of experience. In scholarly discourse, this process is known as 'concept building'.

Concepts can be created only through language. Textual structures are the medium through which disciplined thinking takes place, and concepts are the devices through which this process occurs. Remarkable progress has been made from the days of Locke and Bacon as far as discourse synthesis is concerned. Today, Bacon seems to have anticipated, even if in a seminal way, significant developments relating to the topic of discourse synthesis. Bacon's anticipatory views inspired Robert Boyle (1627–1691), Robert Hook (1635–1703), and Isaac Newton (1642–1727), amongst others, thus having a profound impact on the progress of science. His concept of science as public knowledge (findings have to be published to be effective) is a strong departure from the secrecy of alchemists. *New Atlantis*, with its 'Salomon House' – a strong posthumous contribution given by Bacon to discourse synthesis – has inspired the orientation of leading pioneers in the information professions. From many, we could select the creators of the British Library, and the Belgian politician and creator of the profession of 'documentation', Paul Otlet. (Otlet read *New Atlantis*, in the original Latin version, at the age of 14 and little later wrote his own utopist project, *L'Ile du Levant*).

Descartes' *Discourse on Method* is another signpost for discourse synthesis: 'By building upon the work of our predecessors and combining the lives and labours of many, we might make much greater progress working together than anyone could make on his own'. (We wonder here if Descartes is not himself subscribing to his predecessor Bernard de Chartres's perspective from 'standing on the shoulders of giants?') Decisive have also been the ideals of the Royal Society, echoing Bacon in stimulating a high level of co-operation in science, through correspondence and

communication. From the beginning of the seventeenth century, Bacon's proposals were a real revolution, if the prevailing standards of (minimal) literacy are taken into consideration.

By the end of the seventeenth century the situation had changed drastically in this respect. Licensing restrictions were loosened, restraints on importing foreign imprint of British titles were dissolved, so that a stream for discourse synthesis development was largely laid down. Notwithstanding the fact that by then consensus was more a question of form than of content, because of the main concern of 'men of letters' with 'civility', an environment for obtaining consensus was strongly established.

What parallels exist between the seventeenth and twentieth century? – McInnis asks. Mainly the parallels of the prevailing medium of communication: from personal correspondence and the *Transactions* in Bacon's and Locke's days, to the telegraph and the Internet of the twentieth century. However, the Internet will certainly change the manner in which consensus is achieved from now on.

#### 4. *The triple structure of knowledge*

The core of McInnis project is his attempt at explaining the structures of the scientific literature, laid down as: (a) bibliographic structure; (b) substantive structure; and (c) psychological structure, strictly related to the notion of 'consensus'.

##### 4.2. *Bibliographical structure*

Scholarly research papers are linked in a network of interrelated relationships. Each new work is supported by, and adds to, the information from earlier papers in the same topic. (We could make a point here that this notion of relationship from a document to another has been successfully used by current hypertext technology.) These links may be 'explicit' (with reference from a source, recorded in a footnote or an endnote), or most generally 'implicit', when the source is not revealed by the author. Authors use these citations to validate their own ideas, justifying them through the testimony of an authority in the field, and embedding them in the existing 'consensus'. Thence, two communities may surface: those who cite, trying to insert their ideas in the topic's consensus; and those who are cited, the 'persuasive community', who through their authority validate the claims of the new community of authors (the 'standing on the shoulders of giants' perspective). This way, both communities work towards building consensus. It has to be remarked here that the cited community has not necessarily to be unanimously 'persuasive' in the direction of consensus. Opposing and divergent views also are cited, usually to try and solve a confrontation and to establish a position in a topic. Eventually, one army ends up claiming victory, in spite of any lost battles. Bibliographical structures are always very complex, the more so in face of contentious topics. They take the form of a chronological sequence, similar to that embodied by published works on library stacks, when organised sequentially according to their appearance. Thus, it is a fixed and stable structure, being fluid only at the boundaries through the annexation of new works.

#### 4.2. *Substantive structure*

The substantive content of a body of literature rests upon the framework of the bibliographic structure: each new work becomes integrated in the pre-existing consensus of that area. The substantive structure is ‘that shape assumed by the accumulation of the content of published papers as a consensus is achieved’, or, according to philosophers of science, is ‘the cognitive structures of disciplines’, that is, ‘the currently valid body of knowledge in research fronts’ (p.12). In the scientific literature, the substantive structure is built through natural processes, not by prescription and manipulation. This is why it is called a ‘natural structure’. When extracted from the scientific literature into a hierarchical organisation, of the flow-chart-like type, this becomes a formal structure: concepts indexing and thesaurus construction from the literature is a sort of formal structure, ‘the theoretical logic of the subject’ (Ziman). Furthermore, substantive structure can be analysed under two perspectives: ‘synchronic’ (‘the shape assumed at a given moment by a body of substantive literature as a consensus is achieved’), and ‘diachronic’ (‘the shape assumed by a body of scientific literature as it develops through time’) (p. 13). Of course, these are analytical categories and are subjacent to discourse.

#### 4.3. *Psychological structure*

This structure of scientific knowledge relates to the ability of an author to conceptualise a subject matter concretely. The knower is presented with an issue, provided with her idiosyncratic generative schemata, acquired through previous learning and experience. That is why we do not simply add up to the existing store of knowledge; we integrate new knowledge to this store, rearranging our new schemata in new forms and patterns. Thus, what is learned is integrated to the already known by the individual, in a manner appropriate to her learning style. Therefore, a distinction arises in the individual memory structure, between the formal organisation of a subject matter, and its representation. Many cognitive psychologists are dealing with this ‘psychological structure of knowledge’ right now.

### 5. *Consensus building throughout the sciences*

The collaborators in this edited work, discipline by discipline, view knowledge as consensus, defined as ‘part of a discourse community’s sense of shared traditions, craft skills, and values . . . that arise . . . from a shared sense of identity in being the stewards of a body of knowledge’ (p. 15.) This ‘sense of identity diminishes the significance of the differences on which dissensus and hostile sentiments would otherwise focus’ (Edward Shils). The act of citing others in the field certainly brings identity and cohesiveness to the discourse community (the ‘persuasive community’.) How then does consensus occur? Research literature is organised experience, and the search for this literature is a search for patterns of the previously created organisation, deposited in the ‘public domain’ in the ‘market-place of ideas’. After long evaluation of the findings, a coherent system of ideas is built as consensus. Of course, there are differences in the amount of dissent allowed in every discipline. Universal agreement is elusive, but it is important that discourse communities agree upon meanings of key concepts.

McInnis organises the 16 contributions to this book into seven parts:

I – Consensus/Dissensus and the Politics of Scholarship

Robert Whaples (Chapter 1) on ‘Consensus and Disagreement among American Economic Historians’ opens this section invoking Jonathan Rauch’s ‘Liberal Principle’ of scholarship: ‘checking of each by each through public criticism to decide who is right’. There are, however, disciplinary differences in the way scholars build consensus. How is consensus reached? A group of scholars propose ideas to one another, trying to advance their understanding that they are right, while the opponents are wrong. Through those ideas that survive criticism consensus is reached. Whaples envisages two main techniques to assess consensus: through a review or consensus of the pertinent literature, or asking directly the critical community how they receive a proposition or a set of proposition. Whaples follows this second method of a questionnaire to determine how American Economic Historians agree and disagree among themselves. A list of six conclusions is reached by the study: (1) key works support the economist’s thinking; (2) conclusions are reached exclusively on the base of arguments and evidence, not on authority; (3) complex disputes are never solved, especially because complexity generates ambiguity and as a result dissensus; (4) ideology works against consensus; (5) Greater communication eliminates disagreement; and (6) many economists change their minds along their careers about important issues.

George Mariz, a historian, (Chapter 2) on ‘Scholarship on John Locke in the Late Twentieth Century’ surveys several scholarly ‘industries’ that are sustained by John Locke’s ideas, focusing on the works of Maurice Cranston, C. B. Macpherson, John Dunn, and Richar Ashcroft.

Sheila Ryan Johansson (Chapter 3), writing on ‘The Politics of Discourse Synthesis in the Literature of Health’ bases her findings on the premises that ‘unless some agreement is reached on the meaning of key concepts [such as the concept of “health”], the organisation of knowledge through discourse synthesis cannot proceed’. W. Earle DeCoteau (Chapter 4) writes on ‘Discourse Synthesis in the Literature of Evidence-Based Medicine’ (EBM), defined as ‘a phenomenon where individual clinical expertise is integrated with the best external clinical evidence from systematic research . . . draws from disciplines such as cognitive and educational psychology, decision theory, information science and computer science’.

II – Contrasting Conceptual Frameworks of Synthesizing Discourse: ‘Vertical and Horizontal’ Thinking Versus ‘Associative and Analogical’ Thinking

Carole L. Palmer (Chapter 5): ‘The Information Connection in Scholarly Synthesis’, distinguishes between ‘vertical’ (specialised knowledge in a discrete area) and ‘horizontal’ (broader synthesis integrating fragments from vertical research) paths across knowledge ‘domains’. Palmer makes a point in distinguishing between ‘information’ and ‘knowledge’ (information must be ‘translated’ into knowledge).

Henry Small’s (Chapter 6): ‘A Journey Through Science’ has a similar view of discourse synthesis as Palmer: writing a paper involves in part, the synthesis of prior discourse, added by the need to introduce and integrate new findings. His plan is to present the notion of ‘citation pathways’, and to analyse the pathway from social science and physics, driven by the association and analogical thinking of the

authors of the papers studied. He uses the high citation rate as a measure of strongly verified science.

### III – Synthesizing Discourse in Mathematical Communities

Patricia B. Cerrito's (Chapter 7): 'The Discourse of Mathematics' and Robert Pahre's (Chapter 8): 'Mathematical Discourse and Cross-Disciplinary Communities: The Case of Political Economy', both discuss discourse synthesis in the development of the foundations of mathematics in the twentieth century, through the schools of logicism, intuitionism, and formalism (Chapter 7), and as an application to political economy (Chapter 8).

### IV – The Different 'Takes' on Discourse Synthesis and Postmodernist Scholarship

McInnis juxtaposes Chapters 9, 10, and 11 as three different 'takes' on postmodernist scholarship as related to discourse synthesis. Thomas S. Popkewitz's 'A Changing Terrain of Knowledge and Power: A Social Epistemology of Educational Research' (Chapter 9) 'explores the controversies about the knowledge of the social and educational sciences'. He first studies the relation between the liberal democratic state and modernity in the construction of nineteenth century social and educational science in the United States. Popkewitz's study, combining analytical and historical strategies, draws on 'a broad band of conversations', he calls social and political theory.

Wendell Harris, a literary historian, in 'The Discourse of Literary Criticism and Theory' analyses the elusiveness of discourse synthesis of literary criticism. This discipline draws its vocabulary and explanations from different special groups, making it difficult to come under an integrated discourse.

In Chapter 11, Fuller approaches 'Postmodernism' through a series of questions and propositions:

*Does 'postmodernism' really refer to anything?* Though not generally accepted, the 'postmodernism' of the 1970s undermined the Enlightenment, by challenging the ability of positivism to provide a general improvement of humanity, especially in the form of rational statecraft.

*If 'postmodernism' is the answer, what is the question?* Fuller envisages four possibilities and discusses them at length: (1) the Enlightenment has been tried, but it is time to move on to something else (e.g., Jean-François Lyotard and Richard Rorty); (2) the Enlightenment has proven itself and merits continued pursuit (Toulmin and Jacques Derrida); (3) the Enlightenment has not been given a fair run, but deserves to be (Theodor Adorno, Karl Popper, Juergen Habermas); or (4) the Enlightenment has not been given a fair run – and for good reasons (Bruno Latour, Thomas Kuhn).

*What is/was/will be the postmodern condition?* The postmodern condition falls into three possibilities: (a) that the fragmentation of inquiry is natural and so there is no need to oppose it; (b) that a 'revivalist' position should be maintained; and (c) that pluralism should be maintained. Fuller notes also an inclination to cite several 'end' states: the 'end of science', the 'end of economics', the 'end of politics', and the 'end of history'.

*Postmodernism as a positive worldview.* Fuller here cites the final report of the 'Gulbenkian Commission' as an alternative worldview for scientific inquiry, from a mere 'condition'.

*Conclusion: An example of the multiple register of postmodernism.* Fuller turns here to the influence, in the second part of the twentieth century, of Thomas Kuhn about

the nature of scientific change. Kuhn has ‘postmodernised’ the intellectual world in at least three registers: (1) what the theory says; (2) what the theory applies to; and (3) the consequences of applying the theory.

#### V – Quantifying Consensus

Betsy Jane Becker’s ‘Discourse Synthesis in Meta-Analysis’ (Chapter 12) discusses the motives, techniques and conclusions derived from meta-analytic reviews. For Becker, meta-analysis is the process of using quantitative (statistical) techniques to cumulate the results of series of related empirical studies. It can either refer only to the statistical summaries of data as part of a review, or to the entire review process, including the statistical analysis.

#### VI – Reference Works as Tools of Discourse Synthesis and Consensus

In this section, Raymond G. McInnis, and Paul Durbin discuss dictionaries (Chapter 13): ‘Discourse Communities/Interpretive Communities: The New Logic, John Locke, and Dictionary-Making, 1660–1760’, and encyclopedias (Chapter 14): ‘Encyclopedias and the Integration of Knowledge’ as tools of consensus and discourse synthesis. In Chapter 13, McInnis shows that many of the functions of scholarly dictionaries had their origin in the New Logic. In Chapter 14, Paul Durbin traces the theory and practice of encyclopedic production to the ancient world. Durbin argues that discourse synthesis, through the creation of encyclopedic works, can be done in four ways: (a) order-out-of-chaos; (b) part-to-whole (the Baconian model); (c) partial to comprehensive integration; and (d) topical, paying tribute to the other three models.

Christopher E. Forth in Chapter 15: ‘Educating the Will: Masculinity and Modernity in *La Grande Encyclopédie* (1886–1902)’ adds to the historiography of the development of encyclopedias. Forth restricts his analysis to a particular thread that runs through the texture of *La Grande Encyclopédie*: the crisis of the masculine will in the modern world.

#### VII – Discourse Synthesis: ‘Micro’ and ‘Macro’ Considerations

In this closing section, Nancy Nelson’s ‘Discourse Synthesis: The Process and the Product’ (Chapter 16), presents a different interpretation of discourse synthesis. For Nelson, discourse synthesis has been used for sometime already as reading and writing, integrating material from various sources to create a new text. She started research with ‘student writing’, later expanded her interest to scholarship writing. In 1996, she came across McInnis’s concept of discourse synthesis in *Social Epistemology*, and recognised that her view and McInnis’s could be ‘synthesised’ or complementary integrated: ‘It seems to me that McInnis and I are talking about the same processes, but from different perspectives’.

In general terms, all the contributions to this book see as the main objectives of scholarship to understand and to explain – thence all envision scholarship as seeking the cumulation and integration of knowledge. McInnis concludes that ‘discourse synthesis is, after all, probably the chief factor that motivates scholarship’. The works presented here are only tokens of discourse synthesis studies. Many more will come.

### 6. *Final comments*

This volume contains well-documented References at the end of each chapter, and a Selected Bibliography for each one of the seven parts (pp. 97–408), followed by



a comprehensive Index (pp. 409–446). The reader will certainly be tempted to try an exercise of discourse synthesis, starting with this very book. However, to be able to carry out this exercise, the reader may want to go back to McInnis's *New Perspective* (especially Chapters 9, 10 and 11) for a fuller understanding of the procedures for extracting the three basic structures of a scientific literature. And then will wonder how timely would have been an update, at least in bibliographical form, of the craftsmanship required 'to do' discourse analysis.

Someone who spent long hours researching through the early upper-case-only-computer-printouts would feel more comfortable if the Appendix to Small's paper had been printed in portrait, instead of in landscape orientation. This would have required smaller upper and lower case fonts. This detail can make a difference in a volume otherwise well edited and presented. Additionally, the outcome would have been more up to standard. One could suggest that this expedient would increase readability, while taking the opportunity for adding to the Appendix a proper identification (a title), and a legend description at the end.

Philosophers and scientists in general will be interested in this timely volume, not the least to learn the need for authors to properly disclose their sources in presentation, so that understanding is reached on firmer grounds. Above all else, McInnis, with the collaboration of his supporting peers, seems to have achieved the result he has nurtured for the past few years: a treatise the information professionals, at a time of growing epistemological development, so urgently need.