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Discourse and the Production of Knowledge

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Synonyms
Beliefs; Communication; Discourse; Discourse processing; Knowledge; Talk; Text

Definitions
Social knowledge is here defined as the shared, justified beliefs held by the members of an (epistemic) community. Discourse is variously defined as a communicative event, a form of interaction and as a situated unit of language use.

Theoretical Background

Introduction
Both on discourse and on knowledge there is a vast amount of research since classical rhetoric and epistemology. Yet, there is as yet not a single monograph that explores the obvious insight of the fundamental relationship between these two central notions of the humanities and social sciences, despite the fact that we acquire most knowledge by text and talk, and that in order to produce and understand discourse language users need vast amounts of knowledge. This article summarizes some of the current theoretical and empirical studies that have contributed to this insight, especially in contemporary Discourse Studies and Cognitive Science.

Discourse Studies
Since the 1960s, the cross-discipline of Discourse Studies has vastly extended our understanding of text and talk in all disciplines of the humanities and social sciences, and beyond the psycholinguistics as well as the traditional, structural, and generative grammars of isolated sentences. Discourse today is analyzed as a complex, multimodal object, as a form of social interaction and as a communicative event in its sociocultural context, managed by socially shared underlying cognitive strategies and representations – some of which are to be dealt with in this article (Schiffrin et al. 2001; Van Dijk 2011).

The Theory of Knowledge
Classical as well as much of modern epistemology fundamentally defines (declarative) knowledge as justified true beliefs, with many variations as to the nature and conditions of justification (among a vast numbers of books in epistemology, see, e.g., Bernecker and Dretske 2000). In this article, our approach to the theory of knowledge will be more natural and pragmatic, namely as a multidisciplinary account of the cognitive, social, and cultural properties and functions of the shared beliefs of an (epistemic) community, justified by the variable (epistemic) standards or criteria of that community. This approach implies that knowledge is both contextual and relative. What is assumed to be knowledge now by the members of an epistemic community maybe seen as mere or false belief, or as superstition or prejudice, by members of another community, or by those of the same community later. As a practical test, we assume that beliefs count as knowledge of a community if they are presupposed and taken for granted in the social practices, and hence in the public discourse, of the community. We here find a first and fundamental relationship between discourse and knowledge.

The psychological study of knowledge, since the cognitive revolution of the 1960s and 1970s, analyzed knowledge as organized networks of concepts and categories in semantic memory, and as part of Long-Term Memory, for instance, in terms of schemas, scripts, and prototypes (for review, see Wilkes 1997). It did so largely in isolation from the obvious social psychological insight that most knowledge is not acquired and used by isolated individuals, but shared by, or distributed over the minds of the members of a community.

Under the influence of the emerging neurosciences in the 1990s, psychology today is developing new insights into knowledge defined as an embodied, multimodal system “grounded” in various brain regions, such as those processing vision, movement, and emotion, involved in...
the acquisition and uses of knowledge in the experiences of everyday life (Barsalou 2008, among many other papers).

Discourse Processing
It is within this broad, multidisciplinary framework that we need to account for the cognitive production and comprehension of discourse, and for the role of knowledge both as a condition as well as a consequence of these processes (for reviews and introductions on discourse processing, see, e.g., Graesser et al. 1997, 2003; Kintsch 1998; McNamara and Magliano 2009; Van Dijk and Kintsch 1983).

Discourse Production and Knowledge Management
Given the multimodal and multilevel nature of discourse, the production of text or talk is a situated social practice organized by semiotic (phonological, visual, etc.), syntactic, semantic, pragmatic, and interactional structures based on various kinds of mental representations and organized by cognitive strategies that make sure that the discourse is understandable, well-formed, meaningful, appropriate, and efficient in its communicative situation (despite the vast literature on discourse processing, there are hardly specialized monographs focusing on the production of discourse).

At all these levels of discourse production, first of all, socially shared knowledge of the language, consisting of the lexicon, the grammar, as well as the rules of discourse, interaction and context, obviously plays a central role. At the same time, language users need to activate and apply their knowledge of the world, that is, their general, socially shared knowledge about the objects, people, actions, events or situations talked or written about (for references, see below).

Given the shared nature of social knowledge of the world, as Common Ground (Clark 1996), language users need not express all information in discourse they may assume can be inferred by the recipients from the knowledge they have in common with the speaker or writer. In other words, discourse is essentially incomplete, because many of the propositions that define its local and global meaning and coherence are left implicit in the process of production.

Despite the vast amount of knowledge language users of the same community have in common, there are obviously personal and social differences as to the knowledgeability or the expertise of individual language users. Hence, speakers and authors need to contextually adapt this knowledge management during discourse production to their assumptions about the knowledge of the recipients, or the lack of knowledge of new members of the epistemic community (children, students, foreigners, etc.), as is also the case in the popularization of science. For didactic, persuasive, or emotional reasons, speakers may of course repeat some information they know recipients might or should already have. And conversely, recipients may be manipulated or otherwise abused if the speaker presupposes knowledge they do not have – but still is taken for granted indirectly, even when in fact the beliefs are false.

Further dependent on many contextually variable strategies and constraints, the general pragmatic-epistemic rule of discourse production is that speakers or writers assert propositions they assume recipients do not yet know and cannot infer themselves from their own knowledge. This is at the same time the basic condition of (new) knowledge production as well as of knowledge distribution and reproduction in the community.

Context Models
Language users are only able to epistemically adapt their text or talk to the recipients if they know what the recipients know. Such assumptions are part of their subjective representation of recipients and other relevant aspects of the communicative situation, called their context model, stored in episodic memory, part of Long-Term Memory (Van Dijk 2008, 2009). A dynamically changing context model controls the many variable aspects of discourse that make sure the discourse (fragment) is communicatively appropriate, such as its genre, style, register, and topics. Such a context model consists of a relatively simple schema with categories such as Setting (Place, Time), current Social Action, as well as the Participants (and their current social identities, roles, and relations, and their current cognitive properties, such as their goals and knowledge, as well as ideologies if they speak as group members).

Current multimodal knowledge theories suggest that these context models, defined as models of communicative experience just like any other experience, may well have a multimodal nature, featuring auditory aspects of speech (such as a special tone, stress, or intonation) or the environment (e.g., noise), visual information about participants and the setting, body movements of interaction (gestures, position), as well as opinions and emotions about the participants, the topics of discourse, or the whole speech event (Barsalou 2008).

Central in the context model is a knowledge device that dynamically and ongoingly hypothesizes what recipients already know or may infer from their knowledge, so that
the speaker can strategically adapt the discourse to this assumed knowledge of the recipients, by being more or less explicit or implicit, and manage what information must be asserted and what information may be presupposed, both locally within or between sentences, as well as globally as in the discourse as a whole. One powerful strategy is that if recipients are members of the same knowledge community, recipients are assumed to have the same general knowledge as the speaker or author, except new knowledge the speaker or author has recently acquired by reliable observation, sources (speakers, media), or inference.

**Discourse Comprehension**

Discourse comprehension has many properties in common with discourse production, and is a process that is based on (more or less) the same knowledge of the language and the world as they are used and applied by speakers and writers (Kintsch 1998; Britton and Graesser 1996). The obvious difference is that speakers and writers in principle know what they mean and want to convey, and need to find an appropriate discursive expression to these meanings, whereas recipients start with this discursive expression and need to figure out what the speaker or writer means.

Recipients have their own context model of the communicative situation, with their own information and opinions about the setting, the participants (and their identities, roles, relations, goals, knowledge, etc.) and the ongoing social action. Discrepancies with the context model of the speaker or writer, for instance, about the goal of the communicative interaction, may thus lead to communicative conflicts. Especially relevant for the topic of this article is the role of knowledge in the construction of the meaning of the discourse (see Kintsch 1998; Van Dijk and Kintsch 1983). Since speakers or writers assume recipients are able to infer much information from their (shared) social knowledge, this is precisely what recipients (have to) do: Together with the information derived from what is explicitly expressed in discourse, they ongoingly must generate at least those inferences from their knowledge that are needed to produce a meaningful and coherent semantic interpretation of the discourse (Graesser and Bower 1990). Typically, they may thus generate plausible causes or consequences of events or reasons of action, or fill in many details of socioculturally well-known episodes, such as going to work or to school, shopping, eating in restaurants, birthday parties, or demonstrations, among many others. Obviously, the nature and amount of these inferences crucially depend on the abilities (literacy, etc.), knowledge, goals, or tasks of the recipients (for details, see, e.g., Graesser and Bower 1990).

**Situation Models**

This knowledge-based process of discourse comprehension appears to go far beyond the mere interpretation of words, clauses, or sentences and even beyond the construction of locally and globally coherent discourse meanings. Indeed, the goal of discourse comprehension is not merely to understand the discourse itself, but rather what the discourse is about: what it tells us about some event or situation or the world. It is therefore assumed that besides construing a semantic representation of the discourse (its intension), language users also construe a subjective, multimodal mental model of these events, situations, or episodes, referred to or spoken about (its extension). In other words, to understand discourse means to be able to construe a mental model for it. This model may feature the visual, auditory, sensorimotor, emotional, and other modal aspects that are associated with the way recipients imagine or simulate the event talked or written about (instead of mental models, Barsalou (2008) speaks of simulations to refer to situated comprehension and experiences).

As is the case for (pragmatic) context models and other models of personal experience, these (semantic) models of events or situations are also stored in Episodic Memory (for details on mental models, see Johnson-Laird 1983; Van Dijk and Kintsch 1983; Van Oostendorp and Goldman 1999).

As suggested, general, sociocultural knowledge plays a central role in the construction of this mental model, together with the (new) information of the discourse, and possibly with information derived from old mental models (previous experiences, previous discourses), for instance, by supplying missing inferences about conditions, consequences, participants, details, and other plausible elements of the situation.

Note that the way knowledge is (partly) activated and applied in the construction or updating of such models of the event or situation referred to is controlled by information in the pragmatic context model. In other words, different recipients may interpret the same discourse in a different way by constructing different (semantic) situation models. And conversely, for the same contextual reasons, different readers may also acquire different (new) knowledge from the same discourse, depending on their previous knowledge, interest, motivation, and current goals.
Knowledge Production

Crucial at this point is not only that shared knowledge is strategically (partly) activated to construe semantic representations and mental models, but also may be transformed (formed, changed) by discourse. Indeed, information that is not implied or presupposed by text or talk may be used to build and socially distribute mental models about unknown events, as is the case in everyday personal storytelling as well as in news reports.

When repeated, such discourses and their mental models may be generalized and abstracted from so as to form more general knowledge about this type of event. For instance, news about specific terrorist attacks may be used to build knowledge and attitudes about terrorism. This is a special (discourse) way of learning from personal experience, and a condition for the social reproduction of knowledge as well as other forms of social cognition (attitudes, ideologies, norms, values) in society.

Obviously, besides model-based (i.e., experience-based) acquisition of knowledge, new knowledge may also be produced more directly, as is the case in many forms of pedagogical or expository discourse (Britton and Black 1985), for instance, by generic descriptions of events, objects, or phenomena; by definitions of terms; the use of metaphors; schemas; etc. As is the case for all discourse, such discourse presupposes the general, shared knowledge of the community, but strategically expands this knowledge by various multimodal strategies of knowledge transformation. These may include information about (a) categorical relationships (such as higher-level categories or lower-level subcategories), (b) visual or other perceptual appearances, (c) parts or components, (d) relationships with other objects or phenomena, (e) functions or uses, and so on.

Important Scientific Research

Most of the theoretical issues of discourse processing and the role of knowledge discussed above have been shown to be empirically warranted by (mostly experimental) research. Thus, many studies have shown that discourse comprehension crucially depends on the activation and application of what is usually called "prior knowledge" – although such knowledge is not usually precisely defined (McNamara and Kintsch 1996; see also below).

Thus, perhaps trivially, people who know more about a domain or topic, usually better understand a discourse about such a topic or domain – if only because they are able to derive more inferences and hence are able to construe more detailed mental models of specific events or new schemas of new, generic knowledge.

But, as is generally the case, both outside as well as within in the laboratory, actual knowledge acquisition depends on the structures and strategies of text and context. For instance, because of their larger knowledge, experts may pay less attention to the specific details of text or talk and hence may hardly do better than nonexperts in specific tasks, such as recall or recognition. Similarly, if texts are very explicit they may be less interesting for experts, and hence they may pay less attention and again recall fewer details than nonexperts. And in all cases, it depends on the tasks and hence the goals of the participants: Someone who must correct the style or translate a news report may well learn less about some news event than a reader or a political activist who is specifically motivated and interested in news about a specific topic or domain.

Among the vast number of studies on the role of knowledge in discourse comprehension and hence on learning from text, here is a summary of some of the findings in addition to those that have been mentioned above (for detail, and further references for each result, see especially the chapters in Graesser et al. 2003).

Context Variables

- People in general learn more from text when they have more prior knowledge about the domain or topic of the text (among many studies, see, also Kendeou and Van den Broek 2007).
- People in general have a memory bias for the information with which they agree. However, people with more knowledge about an issue are able to better reproduce two sides of a controversial argument.
- Experts versus nonexperts (high- or low-knowledge subjects) learn differently from texts.
- People learn more from text when they do so interactively, e.g., by discussion about the text.
- More generally, people learn more when they explicitly (must) think about the way they learn from the text (metacognition).

Text Variables

- More cohesive, more coherent, more explicit, and better organized text (e.g., with summaries, headers, conclusions) generally favor comprehension and hence knowledge acquisition.
- Inaccurate prior knowledge needs to be explicitly rejected – it is less efficient to simply present correct knowledge.
- Images may help understanding and learning from text.
Combined Text and Context Variables

In general, people learn more from cohesive, more coherent, and well-organized text, especially if they are less-skilled readers, but the interaction between text structure, prior knowledge, and reading ability is more complex than that.

Unfortunately, most experimental work in the laboratory is focused more on “learning from text” in the narrow sense of what (new) information can be recalled, recognized, reproduced, or applied in specific ad hoc laboratory tasks (see also Kintsch 1991, 1998). Socially shared knowledge, however, should be defined in broader terms, and at least involve relatively long-term or even permanent transformation of our socioculturally shared knowledge as members of epistemic communities. Outside educational situations (classrooms, exams, etc.), few controlled experiments offer insight into these long-term constructions and transformations of our knowledge. Most likely, such new, socioculturally shared, knowledge is acquired and integrated within the knowledge system if it is repeatedly situationally relevant, namely if it is often presupposed for the understanding of public discourse (as is the case for our generally knowledge about computers, the Internet, and DNA, for instance) and if it is taken for granted in other social practices.

Most experimental studies on the role of knowledge in discourse production and comprehension, or on the acquisition of (new) knowledge from discourse, barely reflect on the nature, the structure, and the organization of knowledge in memory, and how such knowledge is changed. In order to examine how exactly people acquire knowledge from discourse, we need to know much more about how the structures of discourse are related to the structures of knowledge, as well as about the many context variables that affect this relationship in actual learning and the use and reproduction of knowledge in society.

Cross-References

- Cognitive Models of Learning
- Discourse
- Discourse Processes and Learning
- Epistemology of Learning
- Knowledge Acquisition
- Knowledge and Learning in Natural Language
- Knowledge Integration
- Knowledge Representation
- Learning from Text

References