MULTIPLE MODELS OF MULTIPLE-TEXT COMPREHENSION: A

COMMMENTARY

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Abstract

Research on multiple source use concerns how readers handle a number of different, often conflicting or discrepant, information sources to construct a mental representation of content. Students are increasingly being exposed to such complex reading situations, both in and outside of school. The digital world demands multiple source use, and students must be prepared to critically evaluate sources varying widely in genre, design, and trustworthiness. In this special issue of *Educational Psychologist*, four articles present different models of how readers approach and process multiple information sources. The four contributions, to varying degrees, represent elaborations and extensions of the Multiple Documents Framework (Perfetti, Rouet, & Britt, 1999). This commentary summarizes the four articles and discusses the articles in relation to prior models and to some assumptions apparently underpinning current models of multiple source use.

Multiple documents literacy refers to the reading and comprehension of different text-based sources on the same issue or situation. Whereas research on reading traditionally has focused on illuminating how readers address single texts, people's increasing access and exposure to numerous information sources in recent decades have revealed that a single-text paradigm may be insufficient. Research on multiple-documents literacy basically emanates from studies on the reading of texts in the domain of history (e.g., Perfetti, Britt, & Georgi, 1995; Wiley & Voss, 1999; Wineburg, 1991), and the most influential model of multiple-documents literacy, the Documents Model, is grounded in research on reading in that domain (Britt, Perfetti, Sandak, & Rouet, 1999; Perfetti et al., 1999). In that model, readers' mental representations of single texts were expanded to mental representations of multiple documents. The Documents Model assumes that different documents describing the same situation will, to some extent, be incomplete and contradictory. If readers are to construct a coherent mental representation of a topic or situation from multiple documents and not a number of isolated representations, those readers must integrate and compare information across the documents as well as align information regarding the different documents (source information) to information presented in the documents.

The four articles in this special issue on Models of Multiple Source Use all, to varying degrees, refer to the Documents Model as a framework for the models presented. The goals are to complement and elaborate on different aspects of the initial model of Perfetti et al. (1999). The articles cover a range of variables potentially related to multiple documents literacy, specifically emphasizing how individual differences, contextual cues, and relations among texts may affect readers' processing of multiple texts. The current group of articles is definitely moving the field forward by presenting a set of interesting hypotheses and summarizing empirical evidence underpinning the models.

This commentary has the following structure: a) summarizing each article and discussing key issues, b) discussing interrelations among the models, and c) raising issues, challenges and questions related to conceptual and theoretical issues.

Summary and Key Issues

The four articles in this special issue do represent somewhat different approaches to how readers perceive and process multiple information sources. Two of the articles do focus on how readers might perceive the task of reading multiple documents, depending on both contextual circumstances and individual differences, and thus hypothesize how such perceptions could affect processing of the documents (List & Alexander, this issue; Rouet, Britt, & Durik, this issue). The two other articles focus more specifically on how discrepancy between reader's beliefs and documents' content (Richter & Maier, this issue) and between different sources (Braasch & Bråten, this issue) may affect text processing. Although the four articles are related, and all contribute to our understanding of multiple documents reading, I will start out by grouping the articles into two subsections according to their approaches.

Perceptions of Task and Context

The article by List and Alexander (this issue) introduces the Cognitive Affective Engagement Model (CAEM). The CAEM represents a proposal to unify established models in the multiple-documents literature focusing on cognitive representations and processes (Perfetti et al., 1999; Rouet & Britt, 2011) with research on the role of interest and attitudes in reading (e.g., Lord, Ross, & Lepper, 1979; Schiefele, 1999). The reading of multiple texts representing different perspectives is often perceived as a challenging task requiring effort invested in evaluation and intertextual processes. Thus, interest and attitudes may increase readers' efforts to address such tasks, and although several studies have confirmed the potential impact of motivational variables on the comprehension of multiple texts (e.g., Bråten, Anmarkrud, Brandmo, Strømsø, 2014; Grossnickle, 2014; Strømsø & Bråten, 2009),

the CAEM represents a new theoretical approach to integrating cognitive and motivational variables in a unified model of multiple-documents literacy.

The CAEM proposes that readers' perception of the reading task is based on the topic, expected cognitive products (learning gain), prior knowledge, and affective engagement, resulting in a motivational and cognitive orientation toward the task – a default stance. Four different default stances reflecting readers' affective engagement and their typical reading behavior with regard to source evaluation and information verification are suggested to explain how different readers approach multiple texts. Readers holding a *disengaged default stance* are not engaged and lack the skills necessary to critically analyze sources. Hence, low strategic effort may be expected when those readers are tasked with multiple texts.

Affective engagement, by comparison, refers to readers' interest in and attitudes toward the reading of multiple texts. Those readers display interest in the content but do not become strategically involved in the texts, implying that readers primarily accumulate information consistent with their interests and attitudes. In contrast, readers who by default adopt an *evaluative* orientation toward multiple texts routinely check source characteristics and text reliability without becoming affectively engaged in the topic or content. Finally, readers maintaining a *critical analytic* approach will be engaged in the texts' topic and possess evaluative strategic skills enabling the construction of a coherent understanding of multiple texts.

The CAEM model is theoretically plausible, and List and Alexander (this issue) convincingly discuss how the four default stances may affect several reading behaviors in different manners, such as text processing and sourcing. Of course, empirical studies are required to test the model, and I suggest that other relevant variables be considered for inclusion in such studies and that the potential relations among some of the previously included variables be further explored. Overall, one has the impression that *motivational*

engagement rests more on interest than on attitudes in the model, although it is not clear how List and Alexander distinguish between those variables.

Related to the latter point, studies have demonstrated that the relation between interest and attitudes varies according to both topic and individuals' prior knowledge (Stenseth, Bråten, & Strømsø, 2016). Thus, it may be problematic that those two variables combined should compose *motivational engagement* in the model. One may, for example, hypothesize that readers with great interest but weak attitude strength and prior knowledge would conform to the *affective engagement* orientation and thus use *information accumulation* as a strategic approach. In contrast, readers strong in interest and attitude strength but low in prior knowledge would only attend to belief-consistent information sources.

In addition, List and Alexander (this issue) underline that the role of prior knowledge in CAEM is an important issue for further research. I also suggest that other motivational variables should be explored with regard to CAEM. These authors argue for restricting motivational variables to interest and attitudes because those variables rely on a learner-content interaction. However, they also highlight that readers' default stance represents their perceptions of task and task goals, also implying that goal orientation and competence-related beliefs, such as self-efficacy, may affect reading behavior. Hence, readers may be motivationally engaged in the content of a set of multiple texts but reluctant to engage in effortful strategic processing because of low self-efficacy and/or the task context (e.g., high stakes).

Finally, relations between students' epistemic beliefs and multiple text comprehension have been demonstrated in several studies (e.g., Bråten, Britt, Strømsø, & Rouet, 2011), indicating that readers' approaches to multiple source use may also be affected by their beliefs regarding knowledge and knowing. Hence, the CAEM represents a much-needed proposal for including motivational variables in research on reading multiple texts. Reading

of texts representing different perspectives on an issue will often require effortful thinking, including considerations of both source credibility and message validity. Thus, the role of readers' engagement in terms of interest, beliefs, and goal orientation should be further studied in future studies.

Whereas the proposed CAEM (List & Alexander, this issue) focuses on students' orientations toward the reading task, the RESOLV model (Rouet, Britt, & Durik, this issue) introduces the potential impact that students' representations of contextual demands and opportunities may have on the formation of reading goals. RESOLV may be perceived as an extension of the MD-TRACE model proposed by Rouet and Britt (2011), with the concept of the *Task model* being highlighted in both models. Rouet et al. (this issue) suggest that readers' construction of a Task model, representing expected reading outcomes, is based on readers' perceptions of significant contextual cues represented in a *Context model*. Research on multiple-documents literacy has only occasionally focused on how context may affect students' reading goals and reading behaviors. Thus, the suggested RESOLV model may help us to better understand the potential interaction between situational features and individual differences.

The point of departure for the RESOLV model is that readers' goals and standards are important predictors of reading processes and outcomes and that we must better understand how readers construct goals in light of their interpretations of contextual cues. Rouet et al. (this issue) emphasize that reading occurs in a physical and social context and that readers initially form a Context model that will guide goal formation. To construct a Context model, readers scan the environment to identify relevant contextual elements that blend with readers' prior experiences, task interpretations, and motivational responses. Based on the resulting mental model of the task and relevant circumstances, readers construct their reading goals.

Both the Context and the Task models are supposed to be dynamic in nature. Contextual demands and opportunities may be modified or changed during the reading session, for example, if time runs out or new information regarding the task surfaces and such new conditions affect the initial models. Some empirical evidence for RESOLV is presented. For example, the reported reading behavior of college students depended on the framing of a reading task, with students acting differently when the task was framed as a peer request rather than an authority request.

The RESOLV model also hypothesizes that different readers may construct different task models even if the context is identical. It has, for example, been demonstrated that sixth graders interpret the purpose of skimming as picking out informative words whereas second graders focus on easy words (Baker & Beal, 2009). Hence, experience and level of reading skills appear to affect students' perception of the task, with such individual differences representing internal conditions affecting task interpretation. Thus, the Context model may be described as constituting both internal and external contextual cues. RESOLV represents a further development of theoretical approaches to better understand how readers generate reading goals (see, for example, McCrudden, Magliano, & Schraw, 2011).

Simultaneously, RESOLV refers to models of metacognition and self-regulated learning, and further development of RESOLV may profit from an extended integration of elements from models of self-regulated learning. The four-phase COPES model of Winne and Hadwin (1998; see also Winne & Nesbit, 2009) describes the first phase as task definition, involving students' considering both external task conditions and internal cognitive and affective conditions. Specifically, the internal conditions are less developed in RESOLV. Students' motivational beliefs, values and goal orientations have been demonstrated to affect perceptions of reading goals and text comprehension by, for example,

influencing students' interpretation of a reading goal as memorization or understanding (Wigfield, Gladstone, & Turci, 2016).

Regarding multiple text comprehension, students' epistemic beliefs have in several studies been demonstrated to relate to comprehension (e.g., Bråten et al., 2011; Richter & Maier, this issue). Readers' beliefs regarding the nature of knowledge in a certain domain may, for example, affect whether their goal is to find the one right piece of information or to compare and contrast information from a number of information sources. Muis's (2007) model of epistemic beliefs in self-regulated learning may represent one approach to the further development of the internal conditions represented in RESOLV.

In summary, the RESOLV model's focus on how contextual clues may be interpreted and affect students' mental representations of the reading goal is timely because contextual elements in the form of available textual resources and a variety of reading situations (school and leisure time) have increased considerably in recent decades.

Beliefs and Contradictions

Richter and Maier (this issue) suggest a two-step model for how readers' prior beliefs may affect comprehension of conflicting information in multiple texts. A key point in the Two-Step Validation Model is that readers' prior beliefs affect memory and comprehension of controversial issues, with belief-consistent information normally having an advantage over belief-inconsistent information during text processing. Thus, biased processing may be regarded as readers' default orientation. Lord and Taylor (2009) argued that there may be good reasons for biased processing "…because acting as though one's assumptions and expectations are correct is generally more adaptive than acting as though one's assumptions and expectations might be wrong" (p. 827). However, readers' resistance to changing pre-existing beliefs may also lead to comprehension difficulties and represent an obstacle to

learning. Hence, the study of readers' preference for belief-consistent information is certainly important in educational psychology.

The first step in Richter and Maier's model concerns how readers routinely appear to rely on prior knowledge and beliefs in both interpreting and evaluating information in texts. The model assumes that evaluation is not necessarily intentional or something that only occurs when readers are challenged by new and perhaps strange or belief-inconsistent information. Engaging in more challenging reading tasks requires more cognitive resources and more effort on the part of the reader. Readers normally hesitate to invest more cognitive effort than what they consider necessary and thus emphasize seemingly plausible information according to their pre-existing beliefs. Validation processes are, however, considered routine in text processing and constitute processes facilitating comprehension. The majority of the time readers remain at Step 1, resulting in both memory and comprehension outcomes being mostly consistent with readers' prior beliefs.

Step 2 in Richter and Maier's model implies that readers under certain circumstances intentionally engage in a deeper evaluation of new information, for example, when reading belief-inconsistent texts or multiple contradictory texts, and construct a deeper and more nuanced mental representation of the content. Whether readers engage in information processing at Step 2 partially depends on the strength of their beliefs, the reading task, text content, and most likely additional contextual factors. Basically, the two-step model reflects dual processing models from the domain of social psychology (e.g., Petty & Briñol, 2012) whereas the justification of the two steps described in the article are thoroughly justified by recent research on students' reading of conflicting information.

Richter and Maier (this issue) refer to several studies indicating that the text belief-consistency effect may be more evident in readers with low than high topic knowledge. Hence, readers with more topic knowledge may be better able to engage in strategic

elaboration strategies at Step 2, enabling those readers to better evaluate arguments from both sides of a controversy. However, this benefit most likely depends on the strength of individuals' initial beliefs (e.g., Gottlieb, & Wineburg, 2012; Kahan et al., 2012) and whether a more coherent belief system is in play (Gawronski & Strack, 2012). Thus, the nature of readers' pre-existing beliefs in terms of their value and integration into a larger belief system may determine whether a text belief-inconsistency effect will occur. Richter and Maier also note that belief-consistency may be the outcome of more strategic text processing at Step 2, for example, when readers wish to defend their beliefs by actively refuting arguments that represent alternative perspectives. However, the authors highlight readers' construction of a balanced mental model of controversial issues as optimal for making informed decisions. Of course, readers should optimally consider the quality of various arguments before drawing conclusions regarding the reasonableness of maintaining or changing initial beliefs. Whether that always implies the construction of a balanced mental model is maybe more of an open question, for example, if readers are exposed to belief inconsistent misinformation.

Richter and Maier discuss several approaches for encouraging the intentionally strategic elaboration of conflicting information, emphasizing instruction to strategically use prior knowledge to validate the plausibility of information and nurture students' awareness of the structure of arguments. In addition, the importance of making students aware of their own pre-existing beliefs has been demonstrated to modify biased information processing in several studies (Beatty & Thompson, 2012; McCrudden & Sparks, 2014; Stanovich, West, & Toplak, 2013). Finally, Richter and Maier (this issue) argue that teaching students sourcing skills may facilitate their evaluation of information sources' trustworthiness, enabling students to better validate presented arguments.

As noted by Braasch and Bråten (this issue), the reading of contradictory information sources may in fact foster students' awareness of source information. The basic assumption

of their Discrepancy-Induced Source Comprehension (D-ISC) model appears to be that the reading of multiple controversial messages may trigger students' attention to and use of source information (metadata) as an integrated component of ongoing comprehension processes. If one text, for example, states that vaccines may improve health and another claims that the vaccine industry is a fraud, the D-ISC model predicts that the reader will question who promoted those two contradicting messages and use that information to better understand the nature of the discrepancy between the two perspectives.

Another approach is to evaluate the logic of the claims presented in the texts (Johnson-Laird, 2012). That approach may, however, demand a heavy cognitive load on behalf of the reader, depending on both prior knowledge and deductive skills. Thus, for most readers, the sourcing strategy may represent a manageable approach to understanding the contradiction. Readers' mental representation of "who said what" is also considered an important element in the Documents Model, which implies that good readers tag source information to key messages in the texts to construct a coherent mental representation (Britt et al., 1999). Whether contradictions elicit such tagging is an interesting question, which may also, as suggested by Braasch and Bråten (this issue), have educational implications.

The D-ISC model is presented as a micro-model framed within the Documents Model Framework (Perfetti et al., 1999) with a primary focus on potential cognitive processes occurring when readers strive to construct an integrated mental model of multiple conflicting texts. The maintenance of cognitive consistency is perceived as a central mechanism in social cognition (e.g., Gawronski & Strack, 2012; Lewandowsky, Ecker, Seifert, Schwartz, & Cook, 2012), and individuals normally search for coherence when reading texts. Discrepancies between two (or more) information sources may be experienced as a gap in coherence that the reader will most likely attempt to "repair" in some manner.

In addition, Braasch and Bråten (this issue) present evidence clearly indicating that sourcing may be a frequently used strategy, assuming that readers become aware of the discrepancy. Interpreting the discrepancy in light of source information (e.g., author, profession, genre, venue, date, and intended audience) does not necessarily imply that contradictions vanish but may help readers evaluate the trustworthiness or organize the mental representation of the texts according to the sources of different statements. The reader may construct a meaningful representation of multiple contradictive texts when source information is represented in an intertext model (e.g., X refutes Y), which in turn relates to the mental representation of the situation or phenomenon mentioned in the texts.

Thus, the D-ISC model suggests contradictions as a potential trigger for strategic sourcing as an integrated process in constructing a full documents model. However, the evidence presented primarily represents readers' source memory and to a lesser degree results indicating the role of source information in interpretation, evaluation, or reflection on the texts' content. Although attention to and representation of source information are important steps in constructing an intertext model, more research is necessary to demonstrate the role of the D-ISC model in multiple text comprehension. High prior knowledge readers, for example, appear to easily identify implausible information (Rapp, 2016) and may not consider it necessary to look up source information when judging one portion of a discrepancy to be unlikely.

In addition, the role of the reading task or context (see List & Alexander, this issue), in addition to the degree of relevance of the discrepancy regarding the reader's goal, may be hypothesized to affect whether the D-ISC would come into play. Thus, if the reading task does not require readers to understand the discrepancy between EPA and Conservapedia, for example, by simply asking readers to describe two different positions, the necessity to look up source information should be reduced—unless the reader has a particular interest in that

topic. More research is required to judge how the D-ISC model will work regarding individual differences and different tasks and contexts. Nevertheless, preliminary results indicate that discrepancies may elicit strategic sourcing and that the use of texts representing conflicting information in educational settings may provide useful tools for promoting sourcing skills.

Relations and Differences

To some extent, the four models presented in this special issue on multiple source use all refer to the Documents Model Framework (DMF) presented by Britt, Rouet and colleagues (Britt et al., 1999; Perfetti et al., 1999; Rouet, 2006). The DMF primarily illustrates the reader's mental representation of multiple texts; the Documents model, which includes a mental model capturing central information from the texts' content; and the intertext model containing information regarding "who said what" and how they relate (Britt & Rouet, 2012). The MD-TRACE (Multiple-Document Task-based Relevance Assessment and Content Extraction) is a model that identifies several important decision steps that are required to construct both a Task model and a Documents model (Rouet & Britt, 2011). Thus, it appears reasonable to describe the Documents model as a model characterizing what mental representations of multiple documents may look like, whereas the MD-TRACE model seeks to describe potential preconditions, processes, and products related to multiple documents comprehension. The MD-TRACE model includes five steps presumably performed in an iterative manner: a) construction and updating of a Task model, b) information needs assessment, c) documents processing, d) task product construction, and e) task product assessment. The four papers presented in this special issue are all related to one or several steps in the MD-TRACE model, and there are also obvious overlaps among some of the models.

For example, both the CAEM (List & Alexander, this issue) and the RESOLV (Rouet et al., this issue) models appear to be more related to Steps 1 and 2 in the MD-TRACE model than to the other three steps. In Step 1, readers construct a task model, that is, the expected learning outcome, based on their perceptions of external instructions and/or on their own learning goals. The outcome of Step 1 is a set of reading goals and plans regarding which actions to take, and the task model thus drives the ensuing steps and processes. New information surfacing during the reading process may induce readers to revise the task model, for example, if text content does not meet readers' expectations. The construction of a task model, and subsequent goals and plans, are central to both the CAEM and the RESOLV models.

However, the CAEM (List & Alexander, this issue) and the RESOLV (Rouet et al., this issue) models appear to emphasize the importance of internal and external variables in this process slightly differently. Whereas the CAEM (List & Alexander, this issue) model focuses on how individual differences in terms of motivational and behavioral dispositions affect readers' goal orientations, RESOLV (Rouet et al., this issue) emphasizes contextual elements, both demands (e.g., assignments) and affordances (e.g., available information resources, prior experiences). The two models differ in which aspects of the task model are highlighted, with CAEM emphasizing the task topic in terms of the texts' content whereas RESOLV focuses more on task requirements. In CAEM, a primary issue is readers' interest in and attitudes toward the topic/content, whereas RESOLV describes how context, for example, situation and requester, may affect readers' perceptions of the task. Yet, both models may be said to describe how readers construct goals from their interpretations of contextual cues as well as from prior experiences, fueling their expectations regarding how to address the perceived reading task. In that respect, one may say that both models are

expanding the first steps of the MD-TRACE model and hypothesizing how different goal orientations will affect the processing of multiple texts.

Richter and Maier (this issue) specifically focus on readers' processing of conflicting multiple texts, with this focus related to Step 3, documents processing, in the MD-TRACE model (Rouet & Britt, 2011). However, Richter and Maier relate such processing to aspects of the task model constructed in the first steps of MD-TRACE and specifically to some of the internal variables highlighted in CAEM and RESOLV: readers' prior knowledge and beliefs. In particular, Richter and Maier appear to share with both CAEM and RESOLV the underlying assumption that readers employ standards of coherence while reading, that is, their desired level of understanding (van den Broek, Bohn-Gettler, Kendeou, Carlson, & White, 2011) and that those standards may be affected by both situational and individual factors.

In the case of the Two-Step Validation (Richter & Maier, this issue) model, the monitoring of standards of coherence are addressed by routine validation during comprehension; that is, readers routinely check whether incoming information is plausible according to prior knowledge and beliefs. Establishing standards of coherence or degree regarding what may be accepted as plausible may be perceived as a common feature of a task model in the three models above. Richter and Maier's primary concern is, however, what occurs when information across multiple texts is inconsistent. Their conclusion is that readers in that case will process belief-consistent information more deeply and consider that information to be more plausible than belief-inconsistent information.

In accordance with the CAEM (List & Alexander, this issue) model, Richter and Maier (this issue) show that belief-inconsistent information normally has a less—if any— prominent position in readers' mental representation of the texts. Whereas CAEM suggests that some readers having a *critical analytic stance* will also consider belief-inconsistent

information in a less biased manner by considering sources thoroughly, Richter and Maier note how interventions facilitating students' sourcing skills have been demonstrated to improve students' processing of conflicting information in multiple texts.

Notably, Braasch and Bråten (this issue) present evidence for the D-ISC model demonstrating how conflicting information enhances readers' attention to source information. Thus, contradictions are described as a mechanism for sourcing, which in turn may help the reader understand, or even resolve, the apparent conflict. D-ISC has basically focused on some of the same processes presented in the Two-Step Validation model, with readers' handling of conflicting information being the primary issue. Both models highlight that readers' awareness of violations in text coherence, represented by inconsistencies or conflicts, may facilitate readers' strategic elaboration of the text. Whereas the Two-Step Validation model point specifically to how readers' prior knowledge or beliefs may affect the processing of inconsistent information, the D-ISC notes how such information may facilitate readers' attention to source information—"who says what"—an important first step in constructing an intertext model.

Such attention to source information in the D-ISC (Braasch & Bråten, this issue), followed by evaluation, is also essential in the CAEM (List & Alexander, this issue) model but in that model is described as a behavioral disposition. However, research presented by Braasch and Bråten (this issue) indicate that sourcing activity may vary more according to textual features, such as inconsistencies, than is implied by the List and Alexander's model assumption regarding behavioral dispositions. However, List and Alexander (this issue) propose that readers adapting evaluative and critical analytic default stances will mobilize more flexible and strategic sourcing skills. In the above models emphasizing sourcing skills, it is, however, less elaborated what such skills could imply, although the CAEM model does specify that document information may be used to evaluate source credibility and to support

integration across texts. The issue of source credibility does, for good reasons, attract

attention by numerous researchers. Less is known about how document information might

facilitate readers' integration, interpretation, and prediction of documents' content.

In summary, the four papers all present models that may be considered elaborations or

extensions of different aspects of the MD-TRACE model of Rouet and Britt (2011), with the

introduction of a variety of contextual, motivational, and textual elements demonstrating the

complexity of studying how readers address multiple information sources.

Issues and Questions

This special issue includes four articles presenting models on multiple source use.

While reading the articles, one question arises: In what manner are these models specific to

multiple source use? It appears relevant to consider whether the four models basically refer to

different aspects of complex reading tasks in general whether students read single or multiple

texts. Such tasks could be to read and comprehend belief-inconsistent content, or text/s

containing contradictory information or different perspectives not resolved or coordinated by

author/s. Of course, the reading of multiple texts requires the same skills as are required when

students read single texts; however, the present articles are not specific regarding what more

may be required when addressing multiple texts. The construction of a context and task

model may surely facilitate the reading of single texts as well as attention to and evaluation of

source information. Likewise, epistemic validation, as demonstrated in studies referred to by

Richter and Maier, will occur in single-text reading. In the DIS-C model, the case of multiple

sources is illustrated by referring to the reader as an "information source" when single texts

are processed. That does make sense in a way because readers do not enter the reading

situation as a blank slate; however, readers' prior knowledge and beliefs are also accounted

for in models of single-text reading (e.g., Kendeou & O'Brien, 2016; McNamara & Magliano,

2009). In other examples presented in some of the articles, multiple sources are presented in

one single text. References to different information sources are quite common in both

narrative and informational texts and sometimes referred to as "embedded sources" (Strømsø,

Bråten, Britt, & Ferguson, 2013). Different perspectives may be represented by such

embedded sources within a single text, and the reader may be left with the task of reconciling

the divergent perspectives. Thus, the notion of embedded sources or the reader as an

"information source" suggests that the reading of multiple sources may also occur while

readers process one "independent" text. Hence, Goldman (2004) suggested that single-text

models may be described as "implicitly intertextual" (p. 325) whereas the reading of multiple

texts is "explicit intertextual". The models presented in this special issue appear to apply to

reading as both "implicitly" and "explicitly intertextual". However, the question regarding

the particular requirements for multiple-text reading – explicitly intertextual - remains

unclear in the present models. The issues highlighted in the models, such as readers'

perceptions of context and task, topic beliefs, source evaluation, validation, and the role of

discrepancies, are all relevant to single-text reading but most likely even more important in

complex reading environments involving multiple texts. It has, for example, been suggested

that reading on the Internet requires that reading strategies be modified in new manners and

that some additional skills are required (Cho, 2014; Coiro, 2011; Leu et al., 2015). For

example, Leu et al. (2015) suggested that the demands of "online text comprehension"

require the reader to place greater emphasis on the definition of important questions (reading

goals) as well as on how to locate information, how to critically evaluate information, and

how to synthesize information from different information sources. The models presented in

this special issue do address such skills to some extent, for example by emphasizing the role

of context and readers' stances in establishing reading goals, as well as conditions for critical

evaluation of source information. However, it is less clear in what way and to what degree

such skills are specific to multiple source use.

Another issue concerns the role of discrepancy. The four articles appear to implicitly assume a common feature of multiple source use, which is that multiple sources more or less represent discrepant or contradictory information. This was also the point of departure for the Document Model Framework that stemmed from research on how students read multiple documents representing partially different perspectives on historical events (Perfetti et al., 1999). To construct an integrated mental representation of such document sets, the DMF suggests that information regarding "who said what" must be represented in a submodel representing source information and interrelations between the documents. If content in two documents is overlapping, the need for an intertext model will be greatly reduced. Thus, the nature of the functional relations between the documents may affect the reader's perceived need to attend to source information to evaluate claims and construct an intertext model. This need was partially confirmed in a study by Braasch, McCabe, and Daniel (2016) in which textual sources presented to readers were either semantically congruent or distinct. The results indicated that participants had better source memory for the semantically distinct texts. Hence, the nature of information sources' relations appears to affect source memory. The strength and salience of contradictions between information sources seem to affect readers' attention to and evaluation of source features and thus their motivation to construct an intertext model. This result was also indicated by results presented by Braasch and Bråten (this issue). In the absence of inconsistency or conflicts, readers will most likely be less likely to construct an integrated mental model of the content of multiple sources because new information will either be ignored or seamlessly adapted to previously processed information (Richter & Maier, this issue; van Oostendorp, 2002).

In summary, inconsistency among different information sources appears to best illuminate the Multiple Documents Framework. Less is known about how models of multiple source use apply to information sources containing only overlapping, complementary or

unique information. Studies on peoples increasing use of social media might indicate that even more attention should be devoted to how readers approach semantically overlapping or complementary information. It has been speculated and partly confirmed that social media to some extent represent "echo-chambers", that is, belief-consistent information sources. For example did Bakshy, Messing, and Adamic (2015) find that the probability of being exposed to ideologically inconsistent compared to consistent content on the news feed service of Facebook, was only 5-8%. One could hypothesize that according to the Two-Step Validation model of Richter and Maier (this issue), readers would in general not engage in deeper evaluation of information they read on that news feed, whereas the CAEM model (List & Alexander, this issue) suggests that readers who by default adapt an evaluative or critical analytic stance will engage in deeper evaluation also of belief-consistent information if that information is task relevant. I would have liked the articles presented in this special issue on multiple source use to have elaborated somewhat more on how readers' might process overlapping and complementary information across sources. However, I believe all the presented models do contribute to a more nuanced and a more comprehensive understanding of the many facets of multiple source use.

<div align="center">Conclusion</div>

The authors of the articles in this special issue on "Models of multiple source use" are to be applauded for their efforts to further develop our understanding of how students perceive and process complex reading tasks involving multiple information sources. Their contributions advance existing models by summarizing recent research and by including findings from research in affective domains. In modern societies, multiple source use is more often the rule than the exception whereas only some decades ago, multiple source use was primarily a matter of expertise. In schools, the coinciding voices of teachers and textbooks dominated whereas students today are more often exposed to numerous and varied sources

when searching for relevant information on the web. However, using multiple sources is far

from being only an issue concerning educational settings. Students also must learn how to

address the myriad information sources of variable quality that they encounter outside of

school. The articles in this special issue add to our understanding of what to consider when

instructional programs are designed to improve students' critical reading skills.

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