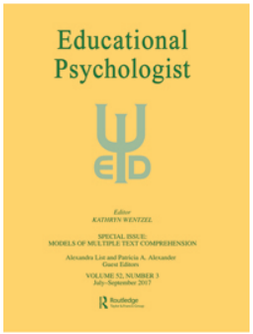

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Analyzing and Integrating Models of Multiple Text Comprehension

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We introduce a special issue featuring four theoretical models of multiple text comprehension. We present a central framework for conceptualizing the four models in this special issue. Specifically, we chart the models according to how they consider learner, texts, task, and context factors in explaining multiple text comprehension. In addition, the models are contrasted along three dimensions capturing different orientations toward multiple text comprehension. Models in the special issue are described as more behaviorally or cognitively focused, as conceptualizing multiple text comprehension as an internally driven or an externally triggered process, and as directly responsive to or indirectly influenced by task. The importance and relevance of this special issue for research on multiple text comprehension are discussed.

Multiple text comprehension (MTC) refers to the processes and behaviors whereby students make sense of complex topics or issues based on information presented not within a single source but rather across multiple texts (Rouet, 2006; Wineburg, 1991). The last 25 years have seen an explosion of research on MTC, corresponding to the advent and popularization of the World Wide Web and its increased integration into the K-12 classroom and beyond (Alexander & DRLRL, 2012; Coiro, 2003; Leu et al., 2007). This is evidenced in both the prevalence of academic publications explicitly referencing individuals' use of *multiple texts* (Figure 1) and the increased discussion in published works of terms like *digital literacy* and *Internet literacy*, to which MTC is integral (Figure 2).

Recognizing this trend, international scholars invested in the study of MTC and in the articulation of explanatory models of such comprehension were participants in a symposium at the American Education Research Association in 2015. The goals for this symposium were threefold. First, in recognition of the burgeoning research on multiple text use, participants articulated what has been empirically established about the process of deriving and integrating meaning across multiple documents (Bråten, 2008; Goldman & Scardamalia, 2013; Wiley & Voss, 1999; Wineburg, 1991). Second, presenters thoughtfully considered the particular challenges posed by multiple-text processing, especially given the quantity and disparate characteristics of digital materials frequently involved in multiple text use (Rouet, 2006; Rouet & Britt, 2012). Third, participants not only introduced their own respective models of MTC but also examined the empirical, instructional, and intervention-related implications of their work.

In developing this special issue, we wanted to build on the success of that symposium and expand on its worthwhile goals. At the same time, this special issue is unique as it represents, to our knowledge, the first compilation of theoretical models of multiple text processing. Indeed, the four models included herein are all explicitly connected to well-established models in this field (i.e., documents model of multiple texts: Britt, Perfetti, Sandak, & Rouet, 1999; MD-TRACE: Rouet, 2006) while representing more contemporary approaches to understanding the processes and constructs underlying MTC.

It was our expectation that offering the educational research community this compilation would both promote discussion of these varied models and instigate efforts to identify common ground among them, as well as to recognize each model's unique contributions. Accordingly, within this overview, we begin by defining MTC and then address two questions about the theoretical models included herein.

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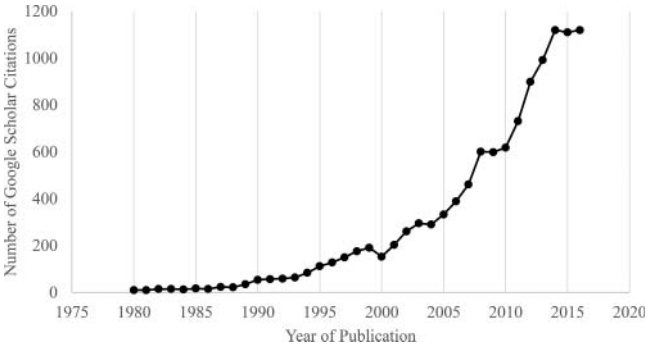

FIGURE 1 Number of Google Scholar citations referencing "multiple texts," by year.

Specifically, for all four models included, we briefly describe how these models are similar and how they can be differentiated in their portrayal of MTC. That is to say, we asked the questions, What do these models have in common? What distinguishes these models of MTC? We believe that the juxtaposition of these models, along with this brief comparison and contrast, will serve to identify future directions for investigation and intervention, charting a course for the evolution of this rapidly developing field. To this end, this special issue concludes with commentaries by two leading scholars in the field of multiple text comprehension, Strømsø and Stadtler. These scholars both expand on the relations among the models introduced in this special issue and discuss their strengths and limitations. Moreover, they connect these models to existing theories of multiple text comprehension (Strømsø, 2017/this issue) and consider their implications for instruction and intervention (Stadtler, 2017/this issue).

WHAT IS MULTIPLE TEXT COMPREHENSION?

The topic of this special issue, MTC, represents a critical area of examination. MTC encompasses a host of skills and strategies invoked when students attempt to make sense of a topic or issue based on information presented, not within a single source but rather across multiple sources of information (Rouet, 2006; Wineburg, 1991). The skills necessary for MTC are diverse and interconnected, and they include identifying, selecting, processing, comprehending, corroborating, evaluating, and integrating information across multiple documents (Rouet & Britt, 2012; Walraven, Brand-Gruwel, & Boshuizen, 2008).

Great interest in multiple text comprehension has developed over the last 25 years, as the Internet has exponentially increased the volume of information sources to which students have easy and instantaneous access (Alexander & DRLRL, 2012; Coiro, 2003; Leu et al., 2007). At the same time, today's students have increasingly been called upon to understand and form opinions about complex topics like climate change, Internet censorship, and pharmaceutical safety (Bråten, Strømsø, & Salmerón, 2011; Kiili, 2013; Stadtler, Scharrer, Brummernhenrich, & Bromme, 2013). Problems such as these are complex in part because a single information source is typically insufficient for critical understanding. Rather, students have to draw on multiple, varied sources of information to conceptualize these issues (Britt, Rouet, & Braasch, 2013; Rouet, 2006). In recognition of this 21st-century reality, the skills necessary for MTC have been deemed not only academically valuable but also fundamental prerequisites for democratic and economic citizenship in today's knowledge-based societies (Ananiadou & Claro, 2009; Goldman & Scardamalia, 2013; Jenkins, Purushotma, Weigel, Clinton, & Robinson, 2009).

Yet, MTC has been found to be a distinctly difficult activity for students, requiring them to contend with a larger volume of information than when processing single texts and to engage in qualitatively different cognitive undertakings when multiple texts are involved (Britt & Aglinskas, 2002; Wiley et al., 2009). Specifically, learners have been found to experience a host of processing challenges associated with MTC. These include difficulties with effectively navigating among a multitude of information sources (Amadieu, Tricot, & Mariné, 2010),

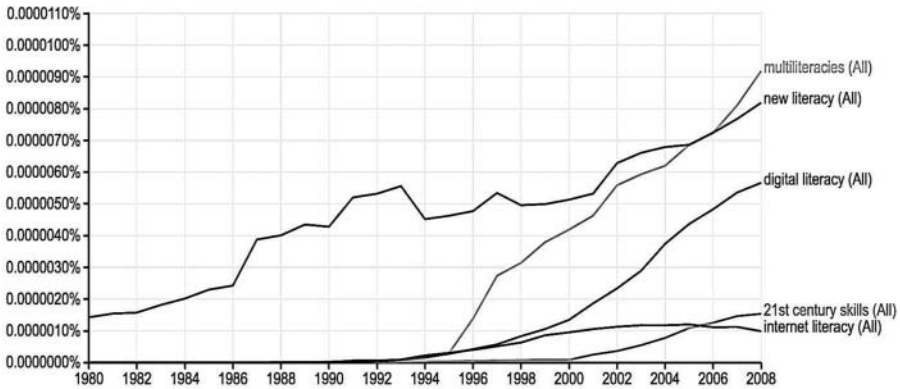

FIGURE 2 Percent of English-language print sources referencing key terms, by year. *Note*. Created using Google Books Ngram Viewer; data available only to 2008; *y*-axis represents percentage of all print sources.

monitoring the comprehension of information and building elaborative connections across texts (Stadtler & Bromme, 2007, 2008; Wiley & Voss, 1999; Wolfe & Goldman, 2005), and evaluating varied documents that reflect differing levels of trustworthiness and expertise (Bråten, Strømsø, & Britt, 2009; Kammerer & Gerjets, 2012; List, Alexander, & Stephens, 2016).

Theories of MTC have emerged to explain the nature of the challenges of this undertaking. Four such theories are included in this special issue. Overall, the featured models can be conceptualized as explaining the challenges students face when processing conflicting information (Braasch & Bråten, 2017/this issue) or information that counters their existing beliefs (Richter & Maier, 2017/this issue). The models also consider the influence of the specific task (List & Alexander, 2017/this issue) or particular context (Rouet, Britt, & Durik, 2017/this issue) on students' actions. In this introduction, these models are conceptualized in terms of their commonalities and distinctions to better understand what is known about MTC and what still needs further elaboration.

WHAT IS COMMON AMONG THESE THEORETICAL MODELS?

In selecting the theoretical models of MTC to incorporate into this special issue, we sought models that not only manifest some common ground but also afforded unique perspectives on the comprehension and integration of multiple documents. To better illustrate these commonalities and distinctions, we present a framework for conceptualizing the models included in this special issue. As shown in Figure 3, all the featured models are united in their explicit or implicit conception of MTC as an interaction between a *learner*, defined by a host of individual difference factors, and a set of *texts*, related to one another in a myriad of ways, driven by a *task*, and occurring within a broader *context*.

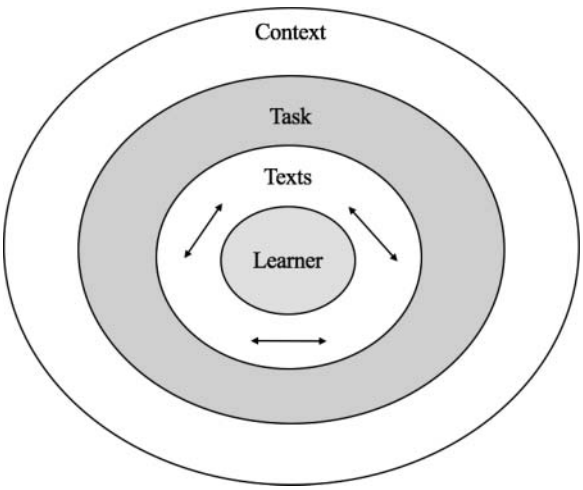

FIGURE 3 Interrelations among factors impacting learners' interactions with multiple texts. *Note*. ↔ represents the interrelations among texts in a multiple text context.

The four models featured in this special issue provide a theoretical foundation for understanding the interrelations among MTC components. First, Richter and Maier (2017/this issue) examine the role of individual difference factors, specifically prior knowledge and beliefs, in students' processing of multiple texts that agree or disagree with their initial positions. As such, in their two-step verification model, Richter and Maier most directly conceptualize the interrelations among the two innermost circles depicted in Figure 3. Next, in their discrepancy-induced source comprehension (DIS-C) model, Braasch and Bråten (2017/this issue) explain how the introduction of conflict across texts influences students' attendance to source information (e.g., the author) and multiple text integration, relative to the presentation of consistent information. In this way, the DIS-C model provides a theoretical foundation for understanding the role of the cross-textual relations in MTC, represented in Figure 3 by the bidirectional arrows in the texts circle. In the cognitive affective engagement model (CAEM), List and Alexander (2017/this issue) consider how learner characteristics and students' interests and attitudes toward task and topic affect multiple text use. As reflected in Figure 3, the CAEM models the interrelations among task, texts, and learner features of MTC. Finally, Rouet et al. (2017/this issue) introduce the RESOLV model, conceptualizing the role of contextual factors in shaping learners' perceptions of task and texts. Signified by the outermost circle in Figure 3, the RESOLV model articulates how students' representations of context impact all subsequent interactions with multiple texts.

Figure 3 can be used to map the models included in this special issue and to identify the components of MTC that each of these models seeks to chiefly explain or has yet to explicitly consider. Beyond this common framework, however, two additional assumptions underlying these models must be acknowledged. First, all four of the models included in this special issue consider MTC to result from the enactment and coordination of varied skills and strategies, including goal setting and relevance determinations (Rouet et al., 2017/this issue), sourcing (Braach & Bråten, 2017/this issue), source evaluation (List & Alexander, 2017/this issue), and information verification (Richter & Maier, 2017/this issue). Notably, across models, the skills emphasized are those associated with evaluating sources and the information within them (List & Alexander, 2017/this issue; Richter & Maier, 2017/this issue) and those used to reduce the volume of information inherent in any MTC situation to essential components (Braasch & Bråten, 2017/this issue; Rouet et al., 2017/this issue). Second, given the constructs explored in these models, all four theoretical approaches point to any multiple text situation as being idiosyncratic, uniquely

defined by a specific context, topic, and content landscape. As such, these models push us to consider further which aspects of MTC may be common across learners encountering multiple texts and which may be unique to individual students completing particular tasks.

WHAT IS DISTINCT AMONG THESE MODELS?

Beyond the aforementioned commonalities, the four models populating this special issue can be distinguished from one another along a number of dimensions (see Figure 4). For one, these models differ in the extent to which they emphasize cognitive or behavioral aspects of MTC. This particular dimension carries forward from traditional models of MTC. For instance, although the documents model of multiple texts (Britt et al., 1999) focuses on students' cognitive representations of the interrelations among texts, the MD-TRACE tends toward conceptualizing multiple text use as a series of five, iteratively executed steps including searching for information and generating a written response (Britt & Rouet, 2012; Rouet, 2006).

Such a distinction likewise holds when applied to the models included in this special issue. For instance, Richter and Maier (2017/this issue) conceptualize the process whereby students reconcile conflicting personal beliefs with information in text as cognitively based, or as reflecting learners' engagement in a process of two-step verification. In contrast, Braasch and Bråten (2017/this issue) adopt a more behavioral approach. Specifically, in the DIS-C model, they argue that the identification of conflict across texts results in students' greater attendance to and recall of source information.

Second, these four models may be contrasted according to whether they specify the processes of multiple text comprehension as predominantly driven by external (i.e., environmental) or internal (i.e., learner) factors. For instance, Braasch and Bråten (2017/this issue) suggest that factors external to the learner, specifically the presence of conflict in text, serve as the initiators of evaluative text processing and students' attendance to source information, such as the author. Rouet et al. (2017/this issue) adopt a more moderated stance, considering students' representations of both internal and external contextual factors as driving MTC. Likewise, Richter and Maier (2017/this issue) consider learners' engagement in verification to arise as a consequence of the interaction between learners' existing knowledge or beliefs and information in text. Finally, List and Alexander (2017/this issue), at the other extreme of this continuum, suggest that individual difference factors, like learners' knowledge of source evaluation strategies and their motivations for task completion, drive multiple text processing.

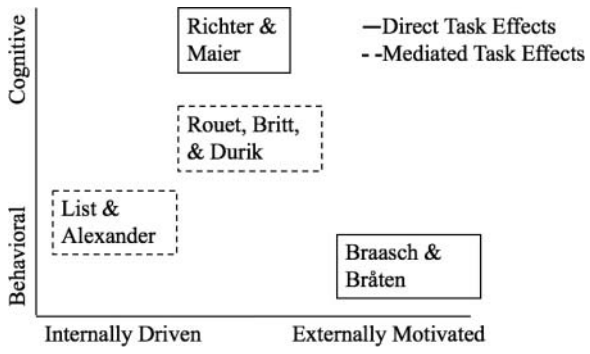

FIGURE 4 Representation of the interrelations among models included in this special issue.

A final dimension distinguishing the models in this special issue deals with the way that each of these theoretical approaches conceptualizes the task driving MTC. Specifically, these models differ according to whether they consider task to have a direct effect on processing or whether they consider an assigned task to be mediated through learners' perceptions and goals. At one end of the continuum, the two-step verification model (Richter & Maier, 2017/this issue) and the DIS-C (Braasch & Bråten, 2017/this issue) suggest that specific task assignments, such as those explicitly directing students to attend to document information, result in the greater scrutiny of information sources. At the other end of the continuum, models by Rouet et al. (2017/this issue) and List and Alexander (2017/this issue) focus specifically on how learners subjectively conceptualize and represent the tasks they are assigned.

Looking across the distinctive features of each of these models, there emerges an outline of the characteristics of a metamodel of multiple text comprehension. Such a model would integrate both behavioral and cognitive aspects of MTC, represent the role of both internal (i.e., learner) and external (i.e., texts, task, context) factors impacting MTC, and explain how the tasks students are assigned and students' conceptions of such assignments drive MTC. In developing this special issue, it is our hope to move the field toward the development of such a metamodel. At the same time, in featuring four distinctive approaches to MTC, we wanted to offer theoretical foundations for understanding the nuances and sensitivities of students' interactions with multiple texts. As MTC continues to increase in its curricular and societal importance, theoretically representing its complexities represents an ambitious but necessary endeavor, one undertaken by all of the authors in this special issue.

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