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# Cognitive Affective Engagement Model of Multiple Source Use

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This article introduces the cognitive affective engagement model (CAEM) of multiple source use. The CAEM is presented as a way of unifying cognitive and behaviorally focused models of multiple text engagement with research on the role of affective factors (e.g., interest) in text processing. The CAEM proposes that students' engagement with multiple texts may be explained by the *default stance* toward task completion they adopt. Students' default stances are defined according to two dimensions: their level of *affective engagement* with the topic of the task and their habits with regard to *text evaluation*. Default stances are used to explain a host of multiple text use behaviors, such as text selection, duration of text access, and document information access, and performance outcomes, including text recall and integration. Directions for future research on the CAEM are proposed.

The past 40 years have been marked by a proliferation of theories explaining how learners come to comprehend information in text (Guthrie & Wigfield, 1999; Kintsch & van Dijk, 1978; McNamara & Magliano, 2009). Overall, these text-processing theories can be characterized as offering two distinct perspectives on learners' interactions with text. Specifically, these theories conceptualize comprehension as either the result of students' strictly cognitive-analytic processing of linguistic information (e.g., Zwaan, Langston, & Graesser, 1995) or, alternatively, students' affective or motivated engagement with text (e.g., Guthrie & Wigfield, 1999).

Over these decades, an additional transformation has emerged within the text-processing literature. In particular, models of text processing have been expanded to embrace not only individuals' comprehension of single texts but also their comprehension and integration of *multiple* textual sources of information (e.g., Perfetti, Rouet, & Britt, 1999; Rouet & Britt, 2011). Although emergent models of multiple text comprehension, such as the *documents model* (Perfetti et al., 1999) and the *multiple-documents task-based relevance assessment and content extraction model* or MD-TRACE (Rouet & Britt, 2011), have unquestionably

expanded our conception of what it means to process written texts, they have remained squarely within the camp of *coldly cognitive* analyses. Models of multiple text comprehension have yet to cross the threshold into more *warm* or *motivated* orientations toward text processing. In this article, our intention is to cross this threshold and introduce a model that unifies cold and warm perspectives on multiple text comprehension and integration—the *cognitive affective engagement model* or CAEM. Evidence for the CAEM comes from a comprehensive review of the literature on multiple text use (List, 2014) and from a series of studies examining students' think-aloud reports, text engagement behaviors, and written responses to multiple text tasks (List & Alexander, 2017; List, Grossnickle, & Alexander, 2016a, 2016b).

## COLD ANALYTIC PROCESSING

In understanding multiple text use, two theories dominate. The MD-TRACE (Rouet & Britt, 2011) characterizes students' problem solving using multiple texts, whereas the documents model framework (Britt, Perfetti, Sandak, & Rouet, 1999) explains how students integrate information across sources to form coherent understanding. These models are similar in their cognitivist focus and in their conceptualization of multiple text comprehension as a series of behaviors and cognitions, sequentially and iteratively executed.

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The MD-TRACE postulates that multiple text use unfolds through a series of five steps (Rouet & Britt, 2011). Specifically, once students are assigned a multiple text task, they develop a *task model*; a cognitive representation of task demands that sets out goals for task completion (Step 1). In Step 2 of the MD-TRACE, students determine that they have an *information need* or decide that accessing multiple texts is necessary to meet task demands. Step 3 involves students' processing of multiple texts with three subprocesses specified: text *selection*, *processing*, and *integration*. Students compose a response to the assigned task in Step 4. In Step 5, students make a determination regarding the extent to which their generated response comports with task demands and with the task model developed in Step 1. This determination results in students either recycling through previous steps in the MD-TRACE or determining the task to be complete.

Complementing the MD-TRACE, the documents model framework explains how students integrate information that is presented across multiple texts to form a unified understanding of a particular topic or issue (Britt et al., 1999; Perfetti et al., 1999). That is, the documents model articulates the comprehension processes involved in Step 3 of the MD-TRACE, text integration. Britt, Rouet, and Braasch (2013) suggested that in integrating multiple texts, students construct two cognitive models of the information presented, the *intertext model* and the *integrated mental model*. The intertext model includes two types of connections: those between the information in a text and that text's document information (i.e., metadata about author, publisher, source type) and those across texts using *intertext predicates* (e.g., agrees with, opposes, provides evidence for). The integrated mental model cognitively represents the common situation or issue described across multiple texts in a coherent and unified fashion.

In integrating multiple texts, then, students' intertext and integrated mental models may be integrated to varying extents. At one extreme, students may formulate a *mush model*, where information is integrated across texts but document information in the intertext model is ignored, leaving students unable to determine the relative trustworthiness of information, based on its sources of origin. At the other extreme, an expert level, *tag all* model may be built. In the tag all model each piece of information is associated with its document of origin, based on the intertext model, and all information is considered in conceptualizing a common situation described across texts, resulting in the construction of a highly complex integrated mental model that, nevertheless, may be too demanding for nonexperts to use. The optimal mental model for multiple text integration, considered best for good, novice comprehenders, has been termed the documents model (Britt et al., 1999). Within the documents model, only *core events* or key situational components are included in the integrated mental model. These core events are associated with their sources of origin through the

intertext model. Linking the intertext and integrated mental models means that, in the documents model, focal discrepancies across texts are reconciled through the consideration of document information and as a result, key components of a situation, presented across multiple texts, are integrated.

The documents model outlines the cognitive processes involved in integrating multiple texts, just as the MD-TRACE identifies the text use behaviors (e.g., text selection) involved. However, more needs to be understood regarding students' reasons or motivations for constructing the intertext and integrated mental models in the first place. Moreover, additional work is needed to explain how and why students engage in the cognitively demanding processes associated with developing a documents model or elect not to do so. The CAEM argues that both the consideration of document information in creating an intertext model and the integration of multiple texts in developing a documents model can be explained, in part, by the level of students' engagement when completing a multiple text task, as well as by learners' skills in carrying out these processes.

## WARM, MOTIVATED ENGAGEMENT

Through more than a century of education and psychology research, interest, alongside other motivational factors, has been strongly associated with text comprehension (e.g., Alexander, Kulikowich, & Jetton, 1994; Dewey, 1913; Hidi, 2001). Two forms of interest have been identified: individual interest and situational interest. *Individual interest* refers to students' stable and sustained positive orientation toward a topic or domain. Applied to text engagement, this form of intrinsic interest has been termed *topic interest* (Schiefele, 2009). *Situational interest* may be described as an externally triggered, temporary, state of arousal. This form of interest may be activated by elements in text including surprise, novelty, or personal relevance. When triggered, situational interest has been referred to as *text-based interest* (Hidi & Baird, 1986).

Both individual and situational interest have been found to effect learning from text (Hidi, 1990; Schiefele, 2001), reflected in a variety of text-based outcome measures, including text recall and retention, comprehension, and inferencing. Ainley, Hidi, and Berndorff (2002) proposed that interest influenced performance as mediated by students' affect (i.e., emotional self-ratings) and increased persistence (i.e., reading time) during task completion. Further, interest has been related to measures of text processing including deep-level versus surface-level strategy use (Schiefele, 1996, 2001), the integration of information in text with prior knowledge (Hidi, 1990; Kintsch, 1988; Schiefele & Krapp, 1996), and elaboration, allowing students to construct richer mental models of information relayed in text.

Indeed, interest and other motivational factors have been found to exert an “independent and differentiated” effect on text processing, relative to prior knowledge and other cognitive factors (Schiefle, 2009; p. 271). In addition to interest, another learner characteristic, students’ *attitudes*, has been found to play both a motivational and cognitive role in text processing. Attitudes have been defined as students’ general judgments or evaluations of a specific topic or issue (Petty & Brinol, 2010).

A number of studies have examined the impact of attitudes on text processing and performance. Generally, students holding strong attitudes about an issue have been found to process information in a way that supports the maintenance of these existing attitudes and a resistance to attitude change (Kardash & Scholes, 1996; Mason & Boscolo, 2004; Taber & Lodge, 2006). In a classic study, Lord, Ross, and Lepper (1979) found that when students holding strong attitudes about a social issue (i.e., death penalty) were presented with both attitude-consistent and attitude-inconsistent texts, they processed those texts differently. Specifically, information and evidence consistent with students’ attitudes were processed at the surface level, without further evaluation, whereas evidence contradictory to students’ views was scrutinized. Lord et al. referred to this selective text processing and evaluation as *biased assimilation*. Moreover, students have been found to rate attitude consistent information and arguments as more *convincing*, *plausible*, and *quality*, as compared to attitude inconsistent information (de Pereyra, Britt, Braasch, & Rouet, 2014; Lord et al., 1979; Munro & Ditto, 1997; Wolfe & Kurby, 2016; Wolfe, Kurby, & Taylor, 2011). Elsewhere, students have been found to simply ignore information deemed to be attitude inconsistent, while preferentially selecting and attending to attitude consistent information (Nickerson, 1998). Students engaging in this kind of information use have been described as evidencing a *conformation bias* or as engaging in *case building* or *motivated text processing*, with the goal of attitude maintenance or attitude defense (Taber & Lodge, 2006).

Although few models have emerged to comprehensively specify the mechanisms whereby attitudes may affect text processing, their role has been identified in students’ selection of information sources (Brannon, Tagler, & Eagly, 2007; van Strien, Brand-Gruwel, & Boshuizen, 2014), selective attention allocation during reading (Graf & Aday, 2008; Maier & Richter, 2013; Wiley, 2005), and text evaluation (de Pereyra et al., 2014; Edwards & Smith, 1996; Lord et al., 1979; Taber & Lodge, 2006).

The role of interest and attitudes has most commonly been explored in studies of single text processing. Limited work has considered the part these motivational factors may play in multiple text use. Yet there is reason to believe that these “warm” characteristics are quite important when students engage with multiple texts. Consistent with the literature that has variably used the term *engagement* to refer

to students’ affective or emotional, cognitive, or behavioral involvement in learning (Connell, 1990; Corno & Mandinach, 1983; Greene & Miller, 1996; Guthrie et al., 1996; Ryan, 2000; Skinner & Belmont, 1993), engagement is used here as an umbrella term to describe learners’ affective, cognitive, and behavioral involvement in multiple text use. As an example, interest may serve as a much-needed resource for sustaining students’ attention during multiple text task completion and for supporting the expenditure of cognitive effort (Bråten & Strømsø, 2006). Likewise, attitudes may play a prominent role in determining the texts that students elect to access and therefore process when presented with the wealth of information inherent in multiple text use (Maier & Richter, 2014).

### INTEGRATING COLD AND WARM PERSPECTIVES WITHIN MULTIPLE TEXT USE

Strictly cognitive (i.e., cold) approaches to multiple text use have been limited in examining the affective and motivational factors impacting text engagement, and work on interest and attitudes (i.e., warm factors) has been applied to multiple text processing only to a limited extent. Nevertheless, cold *and* warm perspectives on multiple text use have been cojoined to some degree.

Interest, for one, has been modeled alongside cognitive factors in studies of multiple text use. Strømsø, Bråten, and Britt (2010) found that interest and two cognitive factors (i.e., prior knowledge and memory for source information) positively predicted students’ performance on an intertext integration task. Bråten, Anmarkrud, Brandomo, and Strømsø (2014) modeled the effects of situational and individual interest on multiple text comprehension, along with cognitive factors (i.e., prior knowledge, need for cognition, effort expended, and reported deep strategy use). In a path model, Bråten et al. (2014) found that although individual interest affected situational interest, neither had a direct effect on multiple text comprehension. However, situational interest did have a strong effect on reported strategy use, and strategy use, in turn, affected comprehension. Also, individual interest had an effect on effort expended, which affected multiple text comprehension. Although Bråten et al. (2014) suggested a distinct role for both cognitive and motivational factors in multiple text processing, more work is needed to more precisely characterize these effects.

For the most part, attitudes have been examined in conjunction with cognitive factors in studies of single text processing. For instance, Kardash and Scholes (1996) found both attitudinal valence (i.e., strength) and students’ need for cognition to independently predict performance. Specifically, attitudinal strength was associated with students maintaining or arriving at an attitude-biased conclusion after text engagement. However, for students exhibiting a high need for cognition (i.e., those reporting a willingness to exert cognitive

effort to solve complex problems), attitudinal effects on text processing were mitigated (Kardash & Scholes, 1996). At the same time, students with a low need for cognition were strongly guided by their attitudes, dismissing or ignoring attitude inconsistent information. These findings suggest a correspondence between motivational and cognitive factors that is potentially reciprocal, whereby motivational factors serve to compensate for limitations in students' cognitive capacities to process texts and vice versa. Elsewhere, a compensatory and reciprocal relation between cognitive and affective factors has been identified (e.g., Maier & Richter, 2014; Wiley, 2005; Wolfe, Tanner, & Taylor, 2013).

In the sections that follow, we introduce the CAEM. First, we describe the two dimensions defining CAEM default stance profiles. Then, we introduce each of the four CAEM default stance profiles and discuss how these may be distinguished from one another. Third, we discuss how CAEM profiles may be expected to differ with regard to common multiple text use behaviors (e.g., text selection, evaluation) and performance outcomes (e.g., recall, integration). After the CAEM is introduced, we specifically delineate the scope of this model and discuss advantages of the CAEM relative to other models of multiple text use. The article closes with a discussion of CAEM limitations and directions for future research.

### COGNITIVE AFFECTIVE ENGAGEMENT MODEL OF MULTIPLE SOURCE USE

Like cognitivist models of multiple text use (Rouet, 2006; Rouet & Britt, 2011), the CAEM examines processing initiated by a task assigned to or self-developed by students. The term *task* is used, here, in its most general form, to encompass both the specific academic assignments that students may receive and students' general desires to learn about a particular topic or issue.

Every task, assigned or self-developed, may be defined by two factors: topic and expected cognitive product. A task's *topic* refers to the subject areas or domains and sub-domains within which it is nested. A task's *cognitive product* refers to the information gains or learning outcome(s) that students expect to result from text access. These may include both general (e.g., knowing more, forming an argument) and more specific (e.g., defining a term, identifying an example) text use outcomes (List et al., 2016b). The way that cognitive products are defined in the CAEM allows these to emerge in response to both externally assigned tasks and to students' personal interests or motivations to learn about particular topics. Once students define a task in terms of its topic and expected cognitive products, the task is further conceptualized in light of learners' affective and motivational inclinations (i.e., interest and attitudes), as well as their prior knowledge. This results in students adopting a *default stance* toward task completion, or a motivational and cognitive orientation toward the task. Students' default stance informs text engagement and guides the multiple source use behaviors they manifest. This process is depicted in Figure 1.

#### Two CAEM Dimensions

According to the CAEM, students may adopt one of four default stance profiles when engaged in multiple text comprehension. These profiles are defined by two dimensions: *affective engagement* and *behavioral dispositions* toward text evaluation and information verification. The affective engagement dimension of multiple text access reflects the degree of students' motivation for task completion. Within the CAEM, this motivation is attributable primarily to students' interest in and attitudes toward a particular topic or task but may also reflect other motivational constructs, like students' efficacy beliefs and task value. The behavioral dispositions dimension captures the extent to which students have mastered the skills necessary to evaluate

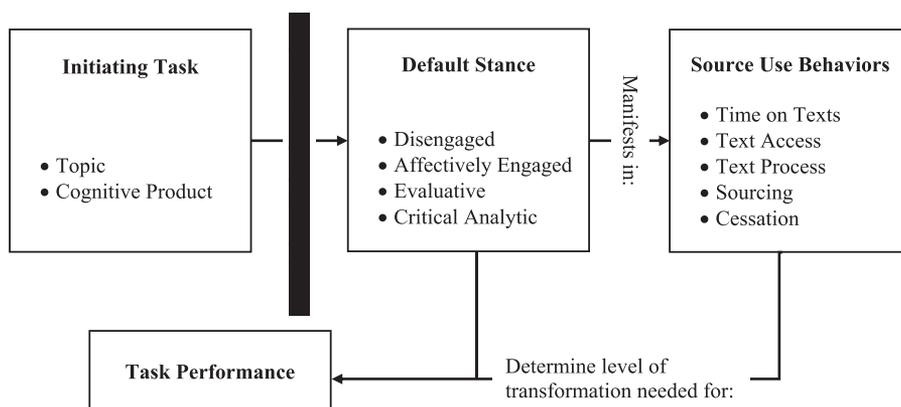


FIGURE 1 Sequence of the cognitive affective engagement model of multiple source use.

sources and the information within them and to integrate texts. Moreover, this dimension captures the extent to which these skills are habituated or commonly engaged by learners.

These two dimensions were identified by reviewing the literature on both multiple source use and single text processing. In considering this literature, our goal was to locate those factors that seemed to make a difference in students' multiple text processing and performance. The multiple text literature has identified a host of external or task-related factors impacting processing (e.g., task type: Wiley & Voss, 1999; note taking: Kobayashi, 2009; modality of text presentation: Britt & Aglinskias, 2002). At the same time, we were specifically interested in determining the student-level or individual difference factors that make a difference in multiple text processing. Consistent with this goal, Goldman, Braasch, Wiley, Graesser, and Brodowinska (2012) and Wiley et al.'s (2009) extreme cases analysis found that differences in students' learning from a multiple text task were primarily attributable to differences in their source evaluation, such as their selection of reliable sources of information over unreliable texts. Indeed, the importance of source evaluation for multiple text integration has been emphasized throughout much of the literature (Braasch, Rouet, Vibert, & Britt, 2012; Britt & Aglinskias, 2002; Stadler & Bromme, 2014) and is reflected in the CAEM through the behavioral dispositions dimension.

The affective engagement dimension emerged from an examination of factors considered to be key to students' single text processing. Models of single text comprehension have long focused on motivation, alongside cognitive factors, as impacting reading (Kintsch, 1980; Wigfield & Guthrie, 2000). Indeed, motivation (i.e., interest) has been found to be associated with both behavioral (e.g., persistence) and cognitive (e.g., depth of text processing; Ainley et al., 2002; Alexander et al., 1994; Fulmer & Frijters, 2011; Schiefele, 1999) aspects of text processing. In the CAEM, learners' motivation for task completion is captured by the affective engagement dimension. Although motivational constructs have been conceptualized as multidimensional in nature, including affective, cognitive, and behavioral components (Pintrich & De Groot, 1990), the term *affective engagement* is used in the CAEM to specifically emphasize the affective or emotionally reactive aspects of motivation. At the same time, the CAEM also captures these other aspects of motivation, including goals and values, albeit to a less explicit extent.

### Default Stances

According to the CAEM, students may assume one of four default stance profiles: (a) disengaged, (b) affectively engaged, (c) evaluative, or (d) critical analytic default

stances. These profiles reflect the degree of students' affective engagement with a particular task and topic and students' habits with regard to source evaluation and information verification. Each default stance profile is described next and depicted in Figure 2. The term *default stance* is used here to indicate a predisposition toward, generally, approaching multiple text tasks in a particular way (e.g., evaluating source information), based on prior experience with such tasks. At the same time, we recognize that certain task factors (e.g., explicitly cuing evaluation) or topics (e.g., of high individual interest) may elicit the adoption of certain default stance profiles over others. As such, the default stance that students adopt toward a task and topic may be considered to be the result of both individual and situation-specific factors.

*Disengaged.* A *disengaged default stance* is characterized by both the absence of affective engagement with the topic of the task and a lack of habituation toward source evaluation. Students who are disengaged are unlikely to self-generate a task, as this may be associated with motivation (e.g., topic interest). Rather, they likely adopt a disengaged default stance toward an externally assigned task, seeking to minimally satisfy task demands while limiting effort expenditure, or to default to *task-satisficing source use*.

Students adopting a disengaged default stance have elsewhere been described as engaging in *information management*, or the cognitively low-level, direct transference of information in texts to a task response, without further manipulation or evaluation (Alexander & the Disciplined Reading and Learning Research Laboratory, 2012). Studies examining patterns in students' navigation or text access have likewise identified a source use profile consistent with a disengaged default stance, characterized by limited text access and low strategic engagement (e.g., limited text revisits; Kiili, Laurinen, & Marttunen, 2008; Lawless, Mills, & Brown, 2002; List & Alexander, 2017; List et al., 2016a).

*Affective engagement.* Students experiencing a strong reaction toward a task may adopt an *affectively engaged default stance* toward multiple text use. The CAEM emphasizes students' interest and attitudes as the individual difference factors most likely to define this default stance. These are the focal motivational variables examined because students' interest and attitudes have been conceptualized as having both cognitive and affective components and because these have been understood as resulting from a learner-content interaction (Alexander, 2003; Hidi & Renninger, 2006; Hidi, Renninger, & Krapp, 2004; Rosenberg & Hovland, 1960; Wolfe et al., 2013).

Although students adopting an affectively engaged default stance may be motivated multiple source users, these students may also be limited in exhibiting the habits

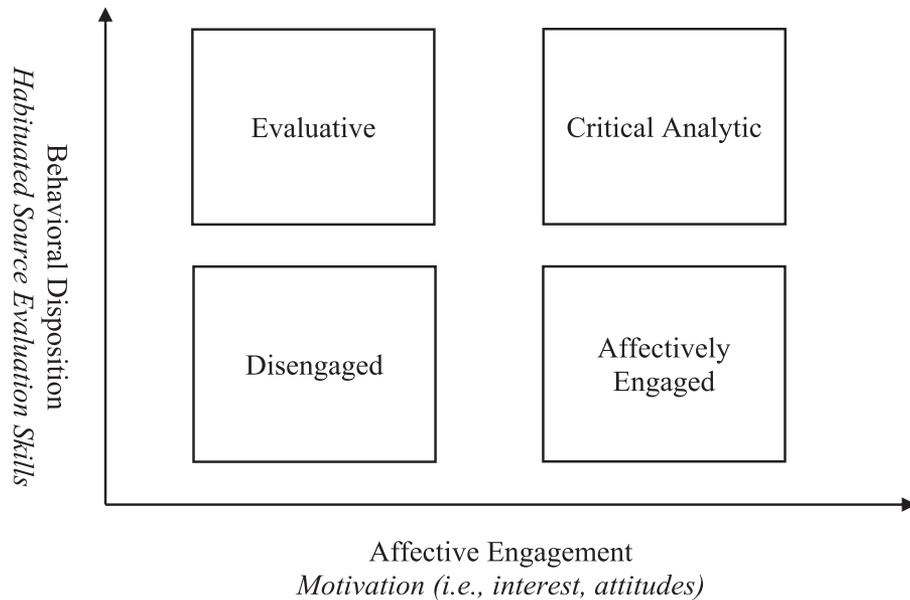


FIGURE 2 Default stance profiles identified in the cognitive affective engagement model of multiple source use.

associated with source evaluation and information verification. Indeed, students adopting an affectively engaged default stance may be considered to engage in *information accumulation* (Bråten & Strømsø, 2011), characterized by persistence in gathering as much information as possible to prolong engagement with texts and topic, but not by the identification of relationships across texts or the integration and evaluation of information. In part, this absence of higher level processing may be the result of deficits in the underlying skills associated with multiple text integration; in part, extreme immersion in information accumulation may distract from higher level processing (Garner, Gillingham, & White, 1989; Harp & Mayer, 1998).

In describing the role of interest in single text processing, Anderson, Reynolds, Schallert, and Goetz (1977) proposed the *slot hypothesis*. In this hypothesis, students' interest is associated with the development of schema-based cognitive structures, such that when students read, interest-related information is *slotted* or added into these structures with ease, facilitating comprehension. Such slotting, although consistent with an information accumulation approach to multiple text use, is not predicated on information evaluation or on deep-level comprehension. Rather it simply constitutes an additive process. Similar phenomena have been described in the attitudes literature. When students hold strong attitudes about a topic, they are likely to process attitude-consistent information at the surface level, without scrutiny, while ignoring or dismissing information that is attitude inconsistent (Lord et al., 1979; Maier & Richter, 2013; Nickerson, 1998; Wiley, 2005).

**Evaluative.** Students adopting an *evaluative default stance* may be principally characterized as having

well-developed habits associated with diligent, evaluative source use. Students exhibiting this default stance may be considered to routinely engage in a variety of behaviors associated with source evaluation and information verification (e.g., checking information currency, verifying author credentials), as assessed by measures such as the Credibility Assessment Scale (Hargittai, Fullerton, Menchen-Tervino, & Thomas, 2010). Of note is that students adopting such an evaluative default stance would likely routinely engage in these behaviors, even absent particular task or topic interest. At the same time, students adopting this default stance may be somewhat immature in their text evaluation. Think-aloud data have shown that although they may readily apply heuristics to evaluating texts (e.g., books are trustworthy sources; Brem, Russell, & Weems, 2001; List et al., 2016b), they may fail to engage in the more cognitively demanding and epistemically sophisticated processes necessary to resolve discrepancies across sources and integrate information (Barzilai & Zohar, 2012; Bråten, Britt, Strømsø, & Rouet, 2011).

**Critical analytic.** The final default stance identified includes students adopting a *critical analytic* approach to multiple source use. This default stance is initiated when students have both well-formed habits associated with critical, evaluative source use and are engaged by the topic of a particular task. When students are both affectively engaged and evaluative in their multiple text use, they may be engaged in *knowledge building* (Alexander & the Disciplined Reading and Learning Research Laboratory, 2012), or the purposeful, elaborative, and reflective processing of information across texts (Murphy, Rowe, Ramani, & Silverman, 2014).

Elsewhere, small subsamples of students have been found to engage in the kinds of strategic and evaluative text use that seems to be consistent with the adoption of this default stance (Goldman et al., 2012; Kiili et al., 2008; List et al., 2016a, 2016b; MacGregor, 1999; Wineburg, 1991).

An assumption of the CAEM is that the adoption of such a default stance may be considered the ideal and may result in documents model construction, as specified by Britt et al. (1999). Nevertheless, resolving discrepancies and integrating multiple texts constitutes an effortful and cognitively demanding process for the typical student (Braten & Strømsø, 2006; Britt et al., 1999; Rouet, 2006). The CAEM suggests that for students to engage in this effortful process, they must have (a) the skills and habits to do so effectively and efficiently and, more important, (b) the motivation to do so. As laid out in the CAEM, moving beyond perfunctory or heuristic-based text evaluation, to evaluate sources in the service of multiple documents integration, requires a specific motivational driver.

### Distinguishing Default Stance Profiles

It is important to distinguish students' adoption of a critical analytic default stance from the other default stance profiles that students may assume. This is best done through example, specifically by examining the role of attitudes, as a motivational factor, in students' multiple text processing. As conceptualized in the CAEM, the motivations that drive students to engage in biased reasoning or case building, or to critically evaluate their own position on a target issue, are one and the same. The distinction among these is that, in one case, attitude-based motivation is coupled with diligent skills and habits with regard to source evaluation, leading to the adoption of a critically analytic default stance, whereas in the other case it is not, resulting in only affectively engaged multiple source use.

In the literature on attitude-based text processing, two patterns of findings have been identified. First, strong attitudes toward task topic have been found to result in selective information processing (i.e., biased assimilation), such that attitude consistent information is easily assimilated into models of comprehension while attitude inconsistent information is ignored (e.g., Maier & Richter, 2013; Taber & Lodge, 2006; van Strien et al., 2014). At the same time, in certain situations, such as when explicitly prompted to do so (Kardash & Scholes, 1996; Mair & Richter, 2013; McCrudden & Sparks, 2014), students have been found to overcome their tendencies toward attitude-driven reasoning and biased assimilation to evaluate information in a more objective and impartial manner (Kobayashi, 2014; Taber & Lodge, 2006). This seemingly contradictory set of findings reflects distinctions in default stance profiles identified in the CAEM. When students are engaged in motivated reasoning, or text processing with the goal of attitude maintenance, they may be said to have adopted an affectively

engaged default stance toward multiple source use. These students are in information pursuit, without the correspondent critical evaluation of this information. Attitude-based affective engagement with multiple texts may result either from students having attitudes so strong that their motivation for attitude maintenance overrides other evaluative considerations or from learners lacking the skills or dispositions necessary to critically evaluate information in texts.

In cases where learners with strong attitudes encounter multiple texts, they may adopt a critical analytic default stance toward text access. Such a stance is defined by learners being motivated, not simply by attitude maintenance but also by a desire to establish the relative merits or veracity of information encountered. Qualitative data from McCrudden and Sparks (2014) indicate that students' adoption of a critical analytic default stance, in association with strong attitudes about a topic, manifests in one of two ways. Learners may engage in either *belief protection* (i.e., scrutinizing conflicting information in the service of belief maintenance) or *belief reflection* (i.e., attitude adjustment or revision in response to conflicting information). Both of these processes are supported by learners' attitude-based motivations for text access and skills in source evaluation and information verification. At the same time, whether students elect to engage in belief reflection or belief protection is the result of the relative strength of their attitudes vis-à-vis their habituation to the critical evaluation of information, as well as other factors (e.g., epistemic beliefs) not specified in the CAEM.

Examining how interest drives multiple text use points to the distinction between affectively engaged and critical analytic processing. Specifically, students demonstrating high interest in a topic may elect to engage in information accumulation (Bråten & Strømsø, 2011). However, additional skills are necessary for learners to successfully synthesize and integrate this information to achieve cross-textual comprehension. When motivation for text access is coupled with the skills needed to evaluate sources and information critically, learners successful adopt a critical analytic default stance.

A critical analytic default stance toward text access may further be distinguished from learners' adoption of an evaluative default stance. Both of these default stance profiles are characterized by students having the skills and strategies necessary for source evaluation and multiple text integration. At the same time, evaluative students, although habituated to source evaluation, may not have the specific motivation in place to engage deeply with sources and content. As a result, we may expect such students to approach multiple text comprehension in a perfunctory manner, following certain routine rules of thumb, without fully considering the specific evaluative demands posed by particular task or texts (List et al., 2016b). For example, evaluative students may use a document-type heuristic when judging text trustworthiness (e.g., trusting books; Brem et al., 2001; List et al., 2016b). But these students may be unlikely to

take the added steps of corroborating information across texts or considering additional document features in their judgments, like information currency.

As an additional distinguisher, evaluative students would not be expected to judge texts in a contextually nuanced way, as may be expected from critical analytic source users, this being a marker of epistemic competence or sophistication (Grossnickle Peterson, Alexander, & List, 2017). An example of contextually nuanced source evaluation comes from a study asking undergraduate students to complete a multiple text task, featuring both print and digital texts (List, Alexander, & Stephens, 2017). Students adopting an evaluative default stance were found to be successful in distinguishing among more or less trustworthy sources (e.g., newspapers vs. blogs). At the same time, these students were found to be overly rigid in their assessments, neglecting to consider that social media (e.g., Twitter), although generally regarded as less trustworthy, might nevertheless prove informative when issues are unfolding in real time.

### Source Use Behaviors

A default stance may be used not only to profile students' approaches to multiple text use but also to interpret behaviors associated with text access. Five text use behaviors may be expected to differ across default stance profiles: (a) time on texts, (b) text access, (c) text processing, (d) sourcing, and (e) cessation of text use. These behaviors were identified as key in earlier models of multiple text comprehension (i.e., information problem solving using the Internet [IPS-I]: Brand-Gruwel, Wopereis, & Walraven, 2009; MD-TRACE: Rouet & Britt, 2011). In addition, three outcomes of multiple text processing (i.e., text recall, multiple text integration, and changes within the individual) are examined here in association with students' default stance assumption.

*Time on texts.* Among the most common behavioral indicators examined in the literature has been the total amount of time students devote to text use, as well as the amount of time they spend on accessing particular texts (Duggan & Payne, 2011; Kintsch, Kozminsky, Streby, McKoon, & Keenan, 1975; Reader & Payne, 2007). Time on texts has been variably interpreted as indicative of students' effort expenditure (Bråten et al., 2014) or degree of engagement (Guthrie, Wigfield, Metsala, & Cox, 1999). Considering CAEM established profiles offers insights into the validity of such interpretations.

Students adopting an affectively engaged or critical analytic default stance toward multiple text use may be expected to devote the most time to text access. For both of these profiles, students' engagement or interest in the text topic may be protracted. Indeed, the association between interest and other affective factors and time devoted to text

access has been documented in studies involving both single (e.g., Ainley et al., 2002) and multiple (Bråten et al., 2014) texts. Nevertheless, additional differences in the time spent on particular texts may emerge across the four profiles.

For example, students adopting a disengaged default stance may be expected to rapidly sequence through texts looking for "the answer" while not spending substantial amounts of time on any one text accessed. In contrast, students in the affectively engaged profile may devote a uniformly long time to reading all texts addressing a topic of interest. Those adopting an evaluative or critical analytic default stance may display more varied text-processing times, alternating between spending a long time reading reliable sources, providing credible information, and quickly scanning and moving on from texts they consider to be low in trustworthiness. Students adopting default stances evidencing a habituation toward text evaluation may be considered to be better at *discriminating* between texts high and low in reliability (Braasch, Bråten, Strømsø, & Anmarkrud, 2014; Goldman et al., 2012; Wiley et al., 2009), with such discrimination manifest as variations in access time across reliable and unreliable texts (Kammerer, Kalbfell, & Gerjets, 2016).

*Text access.* When presented with the opportunity to select from among a set of texts, students differing in assumed default stance may also differ in the number and quality of texts accessed and in their text navigation (i.e., order of text access). For students adopting a disengaged default stance, source access likely unfolds in a sequential manner. Students looking to locate a specific answer across texts likely access each available source in order until an acceptable response is identified (i.e., a *satisficing strategy*; Reader & Payne, 2007). Consequently, students may potentially access quite a large number of texts in the service of identifying an explicitly stated task response. Reader and Payne (2007) further describe this satisficing approach to text navigation as manifest in students cycling through texts, in order, until identifying one meeting their needs and as characteristic of the vast majority of navigation (more than 75% of students; Wilkinson, Reader, & Payne, 2012).

Students assuming an affectively engaged default stance likely access texts preferentially, in an order reflecting the strength of the correspondence between their interest and the text topic. Others have likewise identified an interest-driven source selection heuristic (Ainley et al., 2002; Salmerón, Kintsch, & Cañas, 2006). When texts all address a topic of interest, students adopting this profile may access more texts, as compared to the other profiles. Further, an evaluative default stance may correspond to students accessing a limited number of texts but being selective and purposeful in the texts they choose. Students adhering to this default stance profile may access texts presenting

heuristic-based indicators of reliability, like data or citations (e.g., journal articles; Brem et al., 2001) and may be expected to access multiple texts to corroborate or verify information. Nevertheless, the total number of texts they access, overall, may be quite limited. Low in engagement or motivation for text access, students assuming an evaluative default stance may be expected to refrain from protracted source use.

Like students adopting an evaluative default stance, students falling into the critical analytic default stance profile would likely access texts evidencing high levels of trustworthiness. But unlike their evaluative counterparts, these students may also be likely to access a substantial number of texts, reflecting engagement with the topic of the task. Although students adopting an evaluative default stance would likely select texts highest in reliability, regardless of task, those approaching texts in a critical analytic fashion may adapt their evaluative standards to match task demands and the cognitive products expected.

Reader and Payne (2007) described a number of sophisticated navigation strategies that students, belonging to the critical analytic—and to a lesser extent evaluative—profiles, may adopt in selecting quality sources for task completion. Among these is *sampling* or scanning through available sources quickly before selecting the best texts to draw on. More simplistically, strategic navigation, featuring behaviors like text revisits (i.e., repeated, nonsequential text access) to verify information, may also be indicative of the adoption of an evaluative, or more probably a critical analytic, default stance toward multiple text use (Goldman et al., 2012; List & Alexander, 2017; Salmerón & García, 2011; Salmerón et al., 2006; Wiley et al., 2009).

Looking across the four default stance profiles, these may be distinguished by (a) the number of texts students access (e.g., affective engagement profile), (b) the quality of texts accessed (e.g., evaluative and critical analytic profiles), and (c) whether order of access is sequential (e.g., disengaged profile) or more purposeful. In a study of hypertext navigation, Lawless et al. (2002) were able to classify students' text access into three profiles. Specifically, they identified students as knowledge seekers, feature explorers, or apathetic hypertext users. Although imperfect analogues, the differences among navigation profiles that Lawless et al. (2002) identified mirror those predicted by the CAEM. Specifically, both knowledge seeker and feature explorer profiles accessed materials significantly longer than did apathetic hypertext users. Further, although those in the knowledge seeker profile, corresponding to a critical analytic default stance, accessed more quality hypertext links using more sophisticated navigation strategies, feature explorers accessed the largest number of multimedia sources (e.g., pictures, videos), considered to be of high interest, as we would expect for the affectively engaged.

*Text processing.* Students' multiple text processing has been differentiated as reflecting *skimming* (i.e., rapid, selective scanning) or *reading* (i.e., sustained, linear text processing; Foltz, 1996). In turn, reading has been found to include both surface- and deep-level text processing (Beizhuizen & Stoutjesdijk, 1999). Surface-level processing is linear and *serialistic*, involving students reading through information, in the order in which it appears, and attending to details in text. Deep-level processing is more global or *holistic* and includes students drawing inferences and relating aspects of text to one another to formulate conclusions (Beizhuizen & Stoutjesdijk, 1999; Pask, 1976; Salmerón, Naumann, García, & Fajardo, 2017).

Although skimming, surface-level, and deep-level text processing are all necessary for multiple text comprehension, students adopting different default stances may rely on these processing paradigms to varying extents. Specifically, students with a disengaged default stance toward text access may primarily engage in skimming, quickly scanning sources to find a text-explicit answer. Those adopting either an affectively engaged or an evaluative default stance may be prone to surface-level reading. Students with strong affective engagement may read texts to accumulate information of interest to them. Students with evaluative habits may process texts at the surface level, after validating source quality. In particular, affectively engaged and evaluative profiles may best be distinguished by the types of sources that students access rather than by depth of processing evidenced. Finally, students adopting a critical analytic default stance may be engage in deep-level processing or seek to not only gather information but also work toward a coherent cross-text representation (i.e., cross-textual elaboration; Bråten & Strømsø, 2011).

*Sourcing.* Substantial differences have been found in the extent to which students engage in sourcing (i.e., accessing and considering texts' document information). Nevertheless, consensus seems to be that students engage in sourcing infrequently and rarely without explicit prompting (Britt & Aglinskas, 2002; Gerjets, Kammerer, & Werner, 2011; List et al., 2017; Stadtler & Bromme, 2007). The CAEM suggests that whether students access a text's document information is contingent on their default stance. Students adopting an evaluative or critical analytic default stance may be expected to frequently engage in sourcing, with students adopting the other two profiles much less inclined to do so. Those students holding an evaluative default stance toward text engagement may access document information only to make general determinations of text trustworthiness (e.g., to reduce the volume of information they have to consider; Mason, Boldrin, & Ariasi, 2010). Students adopting a critical analytic default stance toward multiple text use may be likely to attend to the document information in order to ascertain which sources to

trust and to reconcile discrepancies across texts (Britt et al., 1999; Wineburg, 1991).

Theories of multiple text use have separated students' accessing of document information and its incorporation into an intertext model from the use of this information in text integration (i.e., documents model construction; Britt et al., 1999; Perfetti et al., 1999; Rouet & Britt, 2011). In the CAEM, this disjuncture may be understood in terms of motivational factors. For example, students adopting an evaluative default stance may routinely access document information. However, making use of this document information in support of multiple text comprehension and integration requires an added level of motivation, such as that exhibited by students adopting a critical analytic default stance toward text access.

**Cessation.** Few models have specified what may cause students' multiple text use to cease. This cessation may occur due to external (e.g., time constraints) or internal factors. Considering the default stances students adopt allows us to speculate about these factors. For example, for students adopting a disengaged default stance, text use likely concludes once a minimally sufficient task response is identified. Students exhibiting an affectively engaged default stance might well persist until their topic interest is satiated. Alternately, for students adopting this type of default stance, cessation may come about through *saturation* (i.e., satiation or when text access is exhaustive such that any additional information gained from texts is redundant with information already accumulated).

For students holding an evaluative default stance, source access may be rule based and reflective of a preference for reliable vis-à-vis unreliable texts. Students adopting an evaluative default stance may cease source use either when all the reliable texts available have been accessed or when some predetermined number of texts have been consulted (e.g., verifying information across two sources). In either case, cessation occurs when students reach a threshold number of quality sources (i.e., standards-based cessation). Finally, students adopting a critical analytic stance may cease their access only once the expected cognitive products have been successfully achieved. For instance, text use may continue until conceptual understanding is achieved (i.e., cessation through conceptual resolution).

### Shift in Default Stance

Although the CAEM describes students as adopting default stances toward multiple text use prior to text engagement, the consistency or stability of these assumed stances throughout text use remains an empirical question. It seems likely that shifts in default stance can well occur during task performance. For instance, students who are initially disengaged may become more interested in the topic of a task, transitioning to adopt a more affectively engaged

default stance. Conversely, students initially adopting an evaluative default stance may determine that holding such an orientation is overly taxing and, as a consequence, may move to being more disengaged.

Likewise, evaluative learners may shift to a more task-satisficing approach if they recognize that the texts they are encountering are noncontroversial, representing a general consensus on an issue, and therefore do not require particular scrutiny (Braasch et al., 2012). Shifts away from or toward a critical analytic default stance may be less likely to occur. This form of engagement requires and is supported by both affective factors and evaluative habits. These may reinforce one another, such that students are motivated by both their interest in the topic of the task and the process of evaluating texts and resolving discrepancies for deep understanding, itself a cognitively motivating experience (Kintsch, 1998).

### Task Performance

As depicted in Figure 1, the CAEM may be considered to specify multiple source use up to the cessation of text engagement. Yet, often times, an assigned multiple source use task requires not only cognitive gains to result from text access but also for these gains to manifest on measures of text-based task performance. It may be expected that students' assumed default stance and resulting text engagement lead to differences in performance. In the sections that follow we consider how the default stances that students adopt may result in performance differences on common multiple text task outcome measures (i.e., text recall, integration, changes within the individual).

**Recall.** Recall has commonly been used as a text-based performance measure (Bråten et al., 2011; Duggan & Payne, 2011; Salmerón, Gil, Bråten, & Strømsø, 2010; Symons & Pressley, 1993). Students varying in the default stances they adopt might well perform differently on measures of text recall. Students with a disengaged default stance may demonstrate the lowest level of text recall. Conversely, those who are affectively engaged may be expected to recall the most information from texts. Driven by interest, these students are more prone to gather and retain information (i.e., slotting; Anderson et al., 1977), although not necessarily in a conceptually organized manner. Students adopting an evaluative default stance could possibly be distinguishable by their strong recall of document information and their ability to accurately associate specific content with its source. Similarly, those students assuming a critical analytic default stance may be expected to have high levels of recall for both text information and document information and to recall that information in an organized and integrated fashion.

*Integration.* In a number of studies, students' multiple text integration has likewise been examined as a higher level performance outcome. Integration has been assessed by asking students to recognize sentences accurately or inaccurately formed through combining information presented across two or more sources (e.g., Bråten, Strømsø, & Britt, 2009; Bråten, Strømsø, & Salmerón, 2011) or by evaluating students' writing (e.g., Britt & Aglinskas, 2002; Rouet, Britt, Mason, & Perfetti, 1996; Wiley & Voss, 1999). For students adopting a disengaged default stance toward multiple text use, performance on measures of integration and evidence of integration in writing would presumably be quite limited. Likewise, although students adopting an affectively engaged default stance may be expected to perform well on assessments of text recall, they are unlikely to put forth the cognitive effort necessary to reconcile discrepancies across texts. Thus, they would presumably perform poorly on measures of integration.

Students adopting an evaluative default stance may be expected to associate information in texts with document information and may even corroborate information across sources, but they may not truly engage in the conflict identification and resolution processes necessary for true multiple text integration. For instance, this may manifest in students appropriately citing sources when writing and even identifying point of concurrence across texts but being otherwise limited in composing integrated responses that acknowledge and address points of discrepancy. This has been evidenced in students' tendencies to simply ignore conflicts arising across texts, rather than engaging in the more effortful processes associated with reconciliation or conflict resolution (Stadtler & Bromme, 2014). Indeed, the presence of reconciliation and integration may be among the distinguishing features in the responses of students adopting a critical analytic default stance toward text access.

*Changes within individuals.* Besides recall and integration, a third type of outcome, typically assumed in studies involving multiple texts, occurs within the learner, independent of response formulation. Specifically, as a consequence of engagement with multiple texts, students may learn new information, resulting not only in knowledge addition but also potentially in knowledge revision or attitude change. For example, learners reading a number of texts on the topic of climate change may not only come to know more about this topic (i.e., knowledge addition) but, as a result, may start to consider energy conservation to be an important policy issue (i.e., attitude change), ultimately resulting in activism or other behavioral change. The CAEM offers a limited number of insights regarding how particular changes in knowledge or attitudes may arise. Nevertheless, we may expect that students adopting an affectively engaged default stance toward text access may increase their interest or strengthen their attitudes as a consequence of multiple text access. In the attitude literature,

this has been termed *attitude polarization*, referring to a strengthening of learners' attitudes as a result of encountering attitude-consistent information (Boysen & Vogel, 2007; Kardash & Scholes, 1996; McCrudden & Sparks, 2014). In contrast, knowledge or attitude revision may be expected to result only from the deep processing associated with a critical analytic stance toward text access.

## PARAMETERS OF THE CAEM

After introducing CAEM components, we want to define the scope of this model and outline the aspects of multiple text use it seeks to explain. In the last sections of this article we explicitly discuss advantages of the CAEM relative to other models of multiple text use and CAEM limitations.

We acknowledge that no model—including the CAEM—can account for all possible cognitive or motivational factors relevant to multiple text processing. That being said, parameters of the CAEM were developed in reference to how multiple text use has commonly been investigated. In general, studies of multiple text use can be characterized as presenting students with (a) an assigned *task* and (b) a library of *multiple texts* upon which to draw. Commonly, these texts have been (c) *controversial* in nature and have required students to produce (d) *external products* as evidence of text processing. We address each of these four characteristics to delineate the type of multiple text use the CAEM seeks to explain.

### Task

Investigations of multiple text use typically examine students' interactions with texts in response to an assigned task (e.g., Anmarkrud, McCrudden, Bråten, & Strømsø, 2013; Cerdán & Vidal-Abarca, 2008; Wiley & Voss, 1999). Indeed, in much work, a particular task assignment has been considered to be the initiating event for multiple text use (Rouet & Britt, 2011). The CAEM likewise acknowledges task as an important factor guiding learners' engagement with multiple texts. Specifically, the CAEM seeks to explain students' multiple text use in response to tasks that may be characterized as open-ended, that is, tasks that pose a *general purpose* for students' text processing (McCrudden & Schraw, 2007), such as forming an argument, arriving at a decision, or justifying an opinion. These open-ended tasks are not ones that require a single, objectively correct response; rather they allow for a wide variety of responses to be potentially valid, presuming they reflect the comprehension; integration; and, if need be, corroboration of information across texts. At the same time, due to its focus on the affective factors guiding multiple text use, the CAEM also describes learners' text processing as reflecting general motivational inclinations (e.g., interest in or

curiosity about a topic) that operate regardless of whether tasks are assigned to students or are learner generated.

### Multiple Texts

At the most basic level, studies of multiple text use have been defined merely by the presence of multiple sources introduced to students as part of a designated task (e.g., Bråten et al., 2009; List et al., 2017; Rouet et al., 1996). The need for multiple texts most commonly arises when students elect to or are assigned to investigate complex issues for which no single source may be expected to have all of the requisite information (Britt et al., 2013). Descriptions of text access in the CAEM are likewise predicated on learners having access to or being presented with multiple sources of information, such that the information needed to resolve a task is distributed across sources, distinctly attributed or differing in format.

### Controversy

The literature on multiple text use, in recognition of the dubious quality of some of the information on the Internet and the complex nature of knowledge in today's societies (Coiro, 2003; Goldman & Scardamalia, 2013), has carefully and purposefully selected information sources for students to draw upon during task completion. These have typically varied in trustworthiness (Bråten et al., 2011; Bråten et al., 2009; Kammerer & Gerjets, 2012) and have been deliberately assembled to present conflicting views on controversial topics, like climate change or genetically modified food (Kienhues, Stadler, & Bromme, 2011; Rouet et al., 1996; Thomm & Bromme, 2016; Wiley & Voss, 1999). Even though motivation and affect have not been explicitly addressed in these studies, there has been the expectation that controversy or conflict between texts would stimulate learners' engagement and result in more deliberate and strategic processing (Anmarkrud, Bråten, & Strømsø, 2014).

The CAEM adopts a broader lens on multiple text comprehension and integration. Specifically, the CAEM attempts to explain learners' interactions with multiple texts regardless of their comparative trustworthiness, whether the information presented across texts is consistent, complementary, or conflicting in nature, or whether it underscores or contradicts students' existing knowledge and attitudes. The CAEM proposes that even the most straightforward multiple text task, involving concordant texts of comparable trustworthiness, demands that learners engage a host of higher level cognitive processes to achieve integration. Such processes include multiple text navigation and the management of information load (Amadiou, Tricot, & Mariné, 2010; Madrid, van Oostendorp, & Melguizo, 2009; Rouet & Britt, 2011) and information synthesis and organization (e.g., determining relevance, identifying relations across texts; Afflerbach & Cho, 2009; Bråten & Strømsø,

2011; Rouet & Le Bigot, 2007; Wolfe & Goldman, 2005). As such, multiple text comprehension and integration, of any form, may be considered a demanding process that requires a considerable degree of motivation or effort on the part of learners.

Although required when texts are consistent with one another, motivation and multiple text use skills become all the more necessary when students must resolve disagreements across texts or revise their own understanding. This type of reconciliation or knowledge revision requires that students engage a host of additional processing skills, such as corroboration and evaluation (Stadler & Bromme, 2014; Stadler, Scharrer, Brummernhenrich, & Bromme, 2013; Wolfe & Goldman, 2005). Although reconciliation may be considered a more demanding process than the synthesis of multiple texts (Barzilai, Tzadok, & Eshet-Alkalai, 2015; Britt et al., 1999), students' reasoning about multiple texts is, nevertheless, uniformly conceptualized in the CAEM as the joint consequence of motivation and skillful engagement.

### External Products

Within this literature, researchers have assessed multiple text comprehension and integration in a variety of ways, through students' responses both to objectively scored questions and to writing prompts (Bråten et al., 2009; Cerdán & Vidal-Abarca, 2008; Wiley & Voss, 1999). Typically, these assessments have resulted in the development of a physical product (e.g., a written response) thought to correspond to the multiple-text representations readers cognitively construct (Britt et al., 1999). The CAEM, likewise, focuses on the cognitive outcomes of text access (termed *cognitive products*) and considers how these may be reflected in students' performance on multiple text tasks. Moreover, due to its motivational focus, the CAEM recognizes that noncognitive products should likewise result as an outcome of text access. These include learners' increased interest in a topic or attitudinal change.

### Justification for the CAEM

Motivational and skill-based aspects of text processing encompassed in the CAEM are not unique to multiple text comprehension; they apply to single text reading as well (e.g., Guthrie & Wigfield, 1999). Nevertheless, the CAEM is a model specific to multiple text comprehension and integration. The reasons for this are twofold. First, multiple text processing presents unique informational, cognitive, and motivational demands for students, required to process a much larger volume of information, integrate that information, and engage in evaluative processes to a much more deliberate extent (Rouet, 2006). Second, examining multiple text use vis-à-vis

single text processing is associated with a focus on how students comprehend not only traditional print texts but also texts in new, multimedia formats and in novel, digital contexts (Bråten, Braasch, & Salmerón, 2016; Goldman et al., 2010). A feature of these digital contexts is that they require students to engage skills associated with effective multiple text use (e.g., strategic navigation, source evaluation) to an even greater extent and to be all the more motivated to do so, particularly in the face of challenge (Coiro, 2003; Dalton & Proctor, 2008; Leu, Kinzer, Coiro, & Cammack, 2004). Across print *and* digital contexts, the CAEM is focused on understanding the skills, strategies, habits, and motivational stores, and their interactions, that impact students' engagement with and integration of multiple texts.

### CAEM ADVANTAGES

The CAEM draws on both behaviorally and cognitively oriented models of multiple source use (e.g., Britt et al., 2013; Britt et al., 1999; Rouet, 2006). However, as a point of departure, the CAEM argues that multiple text engagement may best be understood in terms of students' motivational orientations toward a task or topic and habits with regard to source evaluation. The CAEM offers a number of advantages relative to extant models.

Like behavioral models, the CAEM understands multiple source use to unfold through a series of text-processing actions (e.g., text selection, accessing document information). However, in classifying students' text engagement according to default stances, the CAEM provides a framework whereby text use behaviors can be differentiated and explained in terms of students' motivation and habits with regard to text evaluation. For instance, although existing models identify source selection as a key behavior within the larger process of multiple source use (e.g., Brand-Gruwel, Wopereis, & Vermetten, 2005; Britt et al., 2013), the CAEM offers potential insights into why some students may elect to access many texts and others only a few, even when responding to the same task. Further, by examining students' source use as guided by a default stance, seemingly independent behaviors (e.g., source selection, evaluation) can be interpreted and unified through a common framework.

A key distinction between existing models and the CAEM is their treatment of topic. Although many models have conceptualized multiple text use as functioning in similar ways across domains, the CAEM suggests that students' engagement with a particular topic is a strong determinant of high-level cognitive processing and performance. Further, the CAEM's focus on task topic alongside students' skills in source evaluation provides a framework for examining domain-specific text engagement, as has

been explored in early studies of multiple text use (Wineburg, 1991).

In positioning students' evaluative skills and habits as central to effective multiple source use, in conjunction with motivation, the CAEM is able to account for a wide range of performance outcomes. In instances where students' performance has been found to differ across tasks, the CAEM explains such discrepancies as a function of motivation or lack thereof. In cases where students perform consistently poorly, limitations in source use skills may be to blame. As such, the CAEM serves as an umbrella framework to explain the variation in multiple source use task performance documented across studies (Goldman et al., 2012). More generally, the CAEM offers at least seven key insights regarding the nature of students' engagement with multiple texts:

1. While students have general approaches to multiple text access, based on their habituated multiple text use skills, they may engage these to greater or lesser extents, depending on task- and topic-specific factors.
2. Multiple text use is a complex process requiring students to be both motivated and affectively engaged and to possess habituated skills in source evaluation.
3. Low performance may be explained through either motivational or skill-based deficits.
4. Students' affective engagement with a particular topic or motivation is central to high-level text processing or multiple text integration.
5. In many cases, students' approaches to text use may be classified as disengaged or restricted in motivation and skill use.
6. There are key qualitative differences among students' manifest source use behaviors. Various source use behaviors may be understood as related to one another and as arising, systematically, from differences in students' orientations toward multiple texts.
7. Across tasks, students may shift the default stances they adopt in prescribed ways, based on their habits with regard to source evaluation and interest in particular topics.

### FURTHER DIRECTIONS

Despite the advantages of the CAEM over other models of multiple source use and the insights garnered, there are several avenues of research that need to be pursued. The avenues identified here are not intended to be a comprehensive list, as presently much of the CAEM is only conceptually defined and therefore speculative. Indeed, each component of the model requires further theoretical specification and empirical support.

## CAEM and Prior Knowledge

First, the role of prior knowledge is not explicitly modeled in the CAEM, although it is known to have a pervasive effect on students' general text processing (Alexander, 2003; Britt & Aglinskias, 2002; Le Bigot & Rouet, 2007; Potelle & Rouet, 2003; Rouet, Favart, Britt, & Perfetti, 1997; Wiley, 2005; Wineburg, 1991). Indeed, prior knowledge likely exerts both a direct effect on the default stances students adopt and an indirect effect, through its association with students' interests, attitudes, and habits with regard to source evaluation. Prior knowledge has likewise been shown to impact a host of behaviors associated with multiple text use (e.g., source selection, processing, and evaluation; Britt & Aglinskias, 2002; Rouet et al., 1997; Wineburg, 1991). As such, a key area for further investigation of the CAEM is how prior knowledge may be associated with students' manifest source use behaviors and task performance.

## CAEM Across Tasks and Contexts

The CAEM aims to be a general model of how learners engage with multiple texts under various task conditions. Other models of multiple text use (e.g., MD-TRACE; Rouet, 2006) have commonly focused on the importance of task in guiding learners' interactions with texts. Within the CAEM, task is conceptualized as impacting multiple text use in three primary ways. First, aligned with other models, the tasks learners are assigned impact the cognitive products they expect to result from text access. These then serve as guideposts for text use and task completion. Second, distinctly described in the CAEM, the topic of any particular task may serve as the motivation or driving force for learners' task completion. Third, as has been found in prior research, certain tasks (e.g., cuing evaluation; Gerjets et al., 2011; Stadler & Bromme, 2007; Wiley & Voss, 1999) may prompt source evaluation and information verification. Considering the importance of task in the multiple text literature, more work is needed to examine how different task characteristics (e.g., task assignment, text presentation format) may elicit and interact with the different default stance profiles students may adopt. Moreover, task features and assumed default stances should be examined in relation to learners' comprehension and integration of the myriad of situations that arise in multiple text contexts—including when texts provide complementary information, directly reference one another, or reflect a conflict.

## Multiple Text Use in the Laboratory and on the Internet

Assumptions regarding multiple text use in the CAEM need to be examined in both laboratory-based and naturalistic settings, including when learners are allowed to search for information freely on the Internet. A variety of factors may distinguish multiple text use in the laboratory from text

engagement in more naturalistic settings. For example, specific features of cessation may be distinct in laboratory settings, where learners' text access is impacted by a variety of artificial constraints (e.g., limited number of texts available, duration of testing session). Likewise, text evaluation may be different in laboratory vis-à-vis naturalistic settings. Researchers carefully design and manipulate source features in laboratory settings, like author and document type. Yet real-life, online contexts commonly present students with ambiguous, incomplete, or misleading cues about document origin (Coiro, 2003). Further examinations of both cessation and text evaluation may give rise to insights into the regulatory and metacognitive processes involved in multiple text task completion that have been underexamined in the literature.

## Intentionality in Multiple Text Use

The choice to use the term *default stance* in characterizing students' approaches to multiple text use is deliberate. The CAEM argues that students are at least somewhat purposeful and consciously aware of the default stances they adopt. More specifically, students are considered to be cognizant of their task interest and the standards they hold for text evaluation. Yet work has found students to be metacognitively aware, only to a limited extent, during multiple text processing (Hofer, 2004; Mason & Boldrin, 2008; Stadler & Bromme, 2007, 2008; Tsai, 2004). Therefore, more work is needed to ascertain how deliberate students are in selecting a default stance to adopt and how conscious they are of its role in task completion.

Despite these limitations, our conceptualization of the CAEM offers at least two insights into how multiple text use may be engendered in today's learners. First, the CAEM emphasizes the importance of explicitly teaching students skills associated with multiple text evaluation and integration. Second, the CAEM suggests that teachers may foster multiple text comprehension not only by introducing students to the specific strategies associated with text evaluation and encouraging their use and habitation but also by providing students with engaging and motivating multiple text tasks.

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