CHAPTER 6

An Evolving Perspective of Constructively Responsive Reading Comprehension Strategies in Multilayered Digital Text Environments

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In the first edition of the *Handbook,* we reviewed research on reading comprehension strategies within the framework of constructively responsive reading (Pressley & Afflerbach, 1995). The result was a compendium of the strategies that accomplished readers use while reading traditional and new forms of text. Also included were several strategies used by readers to construct meaning from multiple texts and nonlinear texts. In the interim between the first and second editions of this handbook, there has been burgeoning research on strategies used in the reading of multiple, nontraditional texts. Thus, our aim in this second edition is to integrate the recent research with our evolving perspective of constructively responsive reading into an updated account of the strategies, especially those required for successful reading in complex, digital text environments.

With this goal in mind, we begin the chapter with a definition of constructively responsive comprehension strategies, and a brief overview of the theoretical and practical significance of continuing research to explicate the strategies. Next, we describe comprehension strategies of online reading as readers work to create coherence and meaning from digital texts. We then update the account of constructively responsive strategies that active readers use to choose, interconnect, and learn from nonlinear, multiple digital texts. We conclude by proposing future directions for research on constructively responsive reading comprehension strategies that can advance theories and practices in reading.

A Definition of Constructively Responsive Reading Comprehension Strategies

Reading comprehension strategies involve mindful plans that demand reader attention and resources, and are focused on the goal of constructing meaning (Kintsch, 1998; van

Dijk & Kintsch, 1983). More specifically, reading strategies are "the reader's deliberate, goal-directed attempts to control and modify their efforts to decode text, understand words, and construct meanings of text" (Afflerbach, Pearson, & Paris, 2008, p. 368). Strategies figure largely when an elementary student effectively searches the Internet for information on the Nez Perce, and reads and understands text to learn new information that is used to help construct a diorama for a class project. The strategies help a middle school student reading two original source texts of the Boston Massacre, one each from newspapers in London and Boston, and analyzing and critically interpreting the texts for their provenance and accuracy. Strategies are essential for the high school student reading and studying for a unit test, realizing that little has been understood and remembered, and deciding to read more carefully the previous three pages. Strategies figure largely as an adult reads two opposing editorials on admitting refugees, to help shape a personal stance toward each editorial, and toward the refugee issue itself.

Strategies are notable for their intentionality: The goal-directed and resourceful application of strategies distinguishes them from other reading processes, which can include perceiving visual information from the page through the eye to the brain (McConkie, 1997) and the automatic retrieval of meaning from well-learned and rehearsed sight word vocabularies (Perfetti, 1985). Strategies vary in form and function. As well, they differ in the attention they demand of readers—oftentimes operating at the edge of consciousness, when highly practiced, while at other times deliberate and resource consuming. In challenging reading situations, strategies may morph from quick and effortless use to the thoughtful and effortful application that characterize skill and strategy, respectively. The nature of a strategy is contextually determined in relation to the reader's familiarity with the text topic, the genre of text, the nature of the reading and reading-related tasks (e.g., read a chapter and answer a theme question), and the degree to which the particular strategy is developed in the reader's repertoire. We may experience such a range of strategy use within one reading event, for example, when we effortlessly process known words or increase the time and attention given to summarizing text, or grind to a slow pace when trying to determine the meaning of unknown words.

Consider the following passage, taken from Afflerbach (1990), which, when read silently, helps us become reacquainted with some of those strategies, raised to consciousness, when the construction of even a literal meaning is challenging:

> It is legitimate to further characterize the broadpoint appearance as a major archeological horizon marker for the eastern seaboard. In the terms of Willey and Phillips, a horizon is "a primarily spatial continuity represented by cultural traits and assemblages whose nature and mode of occurrence permit the assumption of a broad and rapid spread." That a quick expansion of the broadpoint-using peoples took place is indicated by the narrow range of available radiocarbon dates, along with a correspondingly wide areal distribution of components. Once established, the broadpoint horizon developed as a "whole cultural pattern or tradition" in its own right by persisting and evolving over an expansive region for 500 to 1000 years. (Turnbaugh, 1975, pp. 57–58)

Attempts to understand the previous text typically evoke constructively responsive reading comprehension strategies. These may include efforts to identify key vocabulary (e.g., broadpoint), to note the novel use of other vocabulary (e.g., horizon), and to engage appropriate prior knowledge (e.g., What do I know about radiocarbon dating?). Accomplished readers may notice that reading the text requires pertinent disciplinary knowledge

and reasoning. With that in mind, they may parse out the underlying scientific argument into the elements to identify a claim (*It is legitimate to characterize . . .*) and supporting details (*. . . is indicated by . . .*) that are bonded by a theoretical assumption (*In the terms of Willey and Phillips, . . .*). In so doing, they apply effort to integrate key vocabularies and phrases that are semantically and logically interwoven (*. . . a quick expansion . . . the narrow range . . . a correspondingly wide areal distribution . . .*) to make meaning of the important argument in the passage. Thus, the reading process is highly constructive, rendering both literal and inferential meanings. It is responsive to the language and structure that characterize text. These strategies are coordinated and used in conjunction with metacognitive strategies that include comprehension monitoring (realized in relation to rereading and varying the rate of reading to accommodate the degree of comprehension), judging progress toward reading goals, and parsing sentences in an attempt to make them more manageable for processing, as readers seek to construct meaning.

We note that the paragraph, which focuses on Native American broadpoint arrowheads, is an excerpt from a scholarly article in the field of archeology. As research on reasoning about disciplinary texts in science and history suggests (Britt, Richter, & Rouet, 2014; Wineburg, 1991), the need for disciplinary prior knowledge (ranging from common to uncommon) to construct meaning renders reading more difficult and helps bring higher-order strategies to the reader's awareness—allowing the reader to focus on, and perhaps, scrutinize them. Reading the excerpt reminds us that challenging texts demand concerted strategy use. While we are talented and opportunistic reading strategy users, in less complex reading situations we may not always be aware of the strategies we employ.

Strategy use is a central feature of constructively responsive reading (Pressley & Afflerbach, 1995) in which successful readers

> know and use many different procedures (strategies) in coming to terms with text: They proceed generally from front to back of documents when reading. Good readers are selectively attentive. They sometimes make notes. They predict, paraphrase, and back up when confused. They try to make inferences to fill in the gaps in text and in their understanding of what they have read. Good readers intentionally attempt to integrate across the text. They do not settle for literal meanings but rather interpret what they have read, sometimes constructing images, other times identifying categories of information in text, and on still other occasions engaging in arguments with themselves about what a reading might mean. After making their way through text, they have a variety of ways of firming up their understanding and memory of the messages in the text, from explicitly attempting to summarize to self-questioning about the text to rereading and reflecting. The many procedures used by skilled readers are appropriately and opportunistically coordinated, with the reader using the processes needed to meet current reading goals, confronting the demands of reading at the moment, and preparing for demands that are likely in the future (e.g., the need to recall text content for a test). (pp. 79–80)

To summarize, constructively responsive reading comprehension strategies are used with effort and attention, in relation to a reader's goals and abilities. These strategies are developmental in nature, learned and then practiced by increasingly accomplished readers until fluency of strategy use is achieved. This creates the paradox in which the more successful we become with the use of particular reading strategies, the less aware we may be that we are using them. This should not belie the fact of reading strategies' importance to successful reading and the challenge they may present to developing readers. Strategies

play a central role in traditional and more recent forms of literacy, and their use and effectiveness is determined always in relation to the complexity of the reading task.

The Value of Studying Constructively Responsive Reading Comprehension Strategies

The past three decades have seen copious research on reading comprehension and the constructive nature of reading with complex texts and tasks (Anmarkrud, Bråten, & Strømsø, 2014; Cho, 2014; Coiro & Dobler, 2007; Goldman, Braasch, Wiley, Graesser, & Brodowinska, 2012; Lorch & Van den Broek, 1997; Magliano, Trabasso, & Graesser, 1999; McNamara, 2007; Pressley & Afflerbach, 1995; Snow, 2002; Van Dijk & Kintsch, 1983; Wiley et al., 2009). Our conceptualization of constructive reading comprehension strategies is always subject to modification and revision, evolving as our understanding of cognition, literacies and the contexts in which they operate contribute new information (Brown, Collins, & Duguid, 1989; Leu, Kinzer, Coiro, & Cammack, 2004). There is much that is understood and agreed upon when it comes to conceptualizing and categorizing these strategies, yet the field will benefit from continuing efforts to describe reading comprehension strategies, especially those involved in historically recent forms of reading.

Why study constructively responsive reading comprehension strategies? Beyond reminding us of the considerable achievement that reading represents (Huey, 1908), the continued study and explication of reading strategies has important theoretical and practical outcomes. Research on how people use strategies to construct meaning and how they use what is understood from reading contributes to our understanding of theories of cognitive processes, strategy use in reading, and the relation of strategy to other factors, such as readers' prior knowledge and affect in reading. Establishing this depth and breadth of knowledge helps us better understand these intricate workings of mind. The new information serves to replenish and extend our knowledge of the construct of reading. In turn, the refined understanding of basic psychological processes and the contexts in which constructively responsive reading strategies operate should have positive implications for how we conceptualize and foster students' reading development.

Knowledge of reading comprehension strategies, gathered through research, informs successful reading comprehension instruction programs (Pressley, 2000). This knowledge helps us conduct task analyses of the things we would teach related to strategic reading and informs the manner in which we present and portray strategy use for students (Kucan & Beck, 1997). Also, clear understanding of these strategies allows us to gauge comprehension instruction to readers' developmental levels, as along a novice-to-expert continuum, and to design effective features of learning environments that engage students in developing and using high-level comprehension strategies as the means for learning (Palincsar & Schutz, 2011). Furthermore, detailed models of reading comprehension strategies afford a theoretical foundation for assessments with the tasks and procedures that are carefully designed to help us capture and interpret students' reading strategy use (Afflerbach, Cho, & Kim, 2015).

As students read, think, and learn with digital media, new knowledge helps us develop detailed approaches to teaching complex, high-level meaning-making strategies essential to reading for understanding diverse sources (Goldman, Bruitt, Brown, Greenleaf, & Lee, 2010; Leu, Zawilinski, Forzani, & Timbrell, 2014). As noted earlier, constructive

reading strategies are situated actions used by readers as they respond to particular texts and contexts (Pressley & Harris, 2006). In other words, particular strategic actions are selected, organized, and engaged in, intentionally and flexibly, in accordance with how readers interact with materials and resources available in the task environment. Therefore, reading strategies and their uses with diverse media such as the Internet should be regularly examined, as novel text environments may encourage (or require) particular strategic approaches to reading. The ongoing examination of reading strategies should take stock of the changing landscape of texts to provide a foundational knowledge that refines the notion of reading strategy and contributes to successful practice in teaching students to become more competent readers.

Situating Constructively Responsive Reading in a Digital Text Environment

Recent research and related theory describe reading that takes place with a broad scope of texts due to diverse genres, publishing types, designs and structures, modes of information representation, and the media through which texts are created, posted, conveyed, stored, consumed, and reconstructed (Alexander & The Disciplined Reading and Learning Laboratory, 2012). As we strive to understand and describe reading in novel and complex situations, it is particularly exciting (and challenging) to consider complex landscapes of texts on the Internet, namely *computer hypertext*. As defined by Landow (2006), hypertext is "composed of blocks of words (or images) linked electronically by multiple paths, chains or trails in an open-ended, perpetually unfinished textuality described by the terms *link, node, network, web,* and *path*" (p. 2). When reading, students can get easily distracted, confused, and "off track" in the online environment with multilayered textual structures, without a clearly defined scope and sequence. Such reading situations demand the strategic mindsets and behaviors from readers that may vary, especially when compared with reading that is bound to a fixed, limited scope and sequence of text.

Consider using the Internet to learn about stem cells. The reading commences with the use of a Web search engine to retrieve texts and generating pertinent search terms or simply typing *stem cells*. An almost instantaneous result is more than 31 million matches with the search term, displayed as numerous chains of website entries, images, videos, and informational sources. Some of these links may be activated by a series of choices made by the reader in relation to his or her goals and interests. Once the reader clicks on a link to *sciencedaily.com* as deemed useful, he or she will see a set of texts and articles interconnected in a nonlinear way. Each of these texts is not only nested as a piece of information within the site, but it also embeds many links (mostly featuring author names, key words, figures and tables, graphics and illustrations, etc.) that lead to other texts in and out of the site. In this setting, a text or a piece of information very often exists with other texts or pieces of information interconnected through electronic links, both hierarchically and horizontally. Then, strategic readers at this moment, may ponder a series of questions arising in their minds:

- "What do I want to get out of the site?"
- "How would I handle these texts, links, and information?"
- "What do I do to make my reading successful?"
- "What should I read first, next, and then . . . ?"

- "Is the site useful for me to learn about stem cells, and if so, should I explore the site more to see if my tentative hypothesis is right?"
- "Would I stay or leave the site?"

These demands of reading online digital text and the unique reading environment that a vast hypertext system such as the Internet creates, are further described by Landow (2006):

> One of the fundamental characteristics of hypertext is that it is composed of bodies of linked texts that have no primary axis of organization. In other words, the metatext or document set—the entity that describes what in print technology is the book, work, or single text—has no center. Although this absence of a center can create problems for the reader and the writer, it also means that anyone who uses hypertext makes his or her own interests the de facto organizing principle (or center) for the investigation at the moment. One experiences hypertext an an infinitely decenterable and recenterable system, in part because hypertext transforms any document that has more than one link into a transient center, a partial sitemap that one can employ to orient oneself and to decide where to go next. (pp. 56–57)

Within the previously described often ill-defined digital text environment, readers face challenges as they make decisions about information, texts, links, and paths. This is all in an attempt to establish *coherence,* which is the quality of forming a consistent, unified whole of meanings, and a primary rule for interconnecting relevant and useful information. These challenging reading environments call for constructively responsive readers. First of all, as in print-based reading, a primary responsibility for online readers is building a coherent understanding of what they read (Kintsch, 1998). Readers reading webpages must build a *textbase model* by decoding and deciphering symbolic codes in both written language or visual image at both micro and macro levels. Then, readers must construct a *situation model* for which they discern the relevance of the information included in the textbase model and build a cohesive network of important ideas and details. In this course, active readers self-assess different aspects of their reading with criteria for successful reading, as van den Broek, Risden, and Huseby-Harmann (1995) suggested, as *standards for coherence.* Standards for coherence are minimum thresholds for comprehension. The more readers are experienced, competent, and active, the higher the standards they bring to the task of reading. As the standards are thorough, these readers are effortful in managing and coordinating comprehension strategies to meet the standards for constructing a coherent understanding of text.

However, the term of coherence here must be broadly construed for many situations of online hypertext reading. Online reading demands that readers manage strategic mindsets and behaviors to construct, deconstruct, and reconstruct interrelationships of sources, links, systems, and the spaces in which these online textual elements are stored, retrieved, and conjoined. Readers must be able to build a coherent understanding of how different sources support, complement, conflict with, or refute one another, detecting inconsistencies among texts and perceiving their incompleteness (Goldman & Scardamalia, 2013; Rouet, 2006).

Readers must be conscious about the construction of reading paths. A *reading path* traces how a reader determines, orders, and reads texts (Kress, 2003), or simply speaking, the route that one's eye (and attention) follows as he or she navigates within, between, and across texts (Hiippala, 2012). Active readers construct individualized reading paths in an

online hypertextual space toward goal attainment by choosing and sequencing texts. As seen in Figure 6.1, online reading involves three levels of coherence building with regard to (1) information comprehension, (2) intertextual connection, and (3) construction of reading paths. Constructively responsive readers bring higher standards for coherence to processing text content, building intertextual relationships among sources in the minds, and constructing paths for making critical decisions about texts, sources, links, and information spaces. In the following sections, we describe the constructively responsive strategies operating at each level of the coherence-building process of online reading.

Constructively Responsive Strategies for Building a Coherent Representation of Text Information

We first consider a long tradition of research on text comprehension (Garner, 1980; Kintsch, 1998; McNamara, 2007; McNamara & Magliano, 2009; Magliano et al., 1999; van den Broek, Rapp, & Kendeou, 2005; van Dijk & Kintsch, 1983; Zwaan & Singer, 2003), which provides a foundation for more recent research that seeks to describe how people construct meaning from online text in a coherent manner. An array of strategic processes is involved in comprehending a written text, ranging from grappling with word meanings (Cain, Oakhill, & Lemmon, 2004), activating and applying text-relevant prior knowledge (Anderson & Pearson, 1984), generating causal inferences (Graesser & Bertus, 1998), to judging the importance of text information (Alexander & Jetton, 1996), constructing main ideas (Afflerbach, 1990), detecting and solving processing difficulties (Brown, 1980), and self-testing about different aspects of the text and the reading (Wyatt et al., 1993). As research on online reading suggests, these literal and inferential comprehension strategies, performed at both cognitive and metacognitive levels, are crucial to the successful reading of digital texts (Cho, 2014; Coiro, 2011; Duke, Schmar-Dobler, & Zhang, 2006).

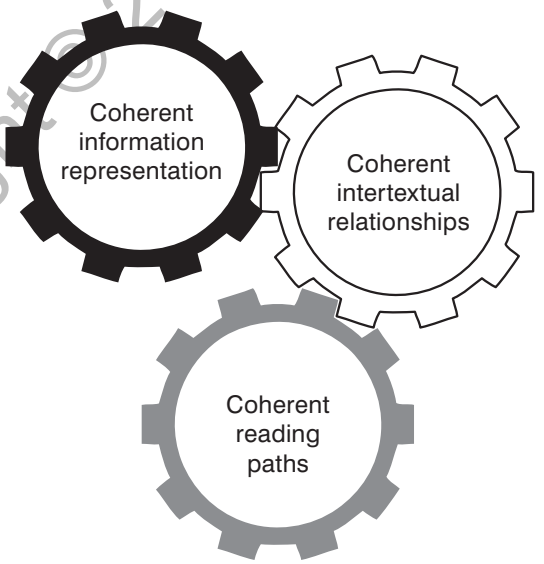

FIGURE 6.1. A multilevel coherence-building process of reading digital sources.

Observation of talented readers reveals that there is something startlingly complex that happens when the eye meets the page (or screen), and research increasingly informs us as to the inner workings of this impressive human accomplishment. Pressley and Afflerbach's (1995) meta-analysis of research that uses think-aloud protocol data yielded a comprehensive catalog of the strategies readers use when reading conventional text. The analysis of 37 published research studies and synthesis of findings across the studies contributed to the detailed description of constructively responsive reading. Pressley and Afflerbach characterized constructively responsive reading as expert and accomplished, involving three broad areas of strategy use: identifying and learning important information, monitoring one's own thinking processes, and evaluating different aspects of text. For example, explicitly looking for related words, concepts, and ideas, and using them to construct a main idea or summary statement, is a strategy for identifying and learning important information in text. Determining that a word is unknown, then rereading to try to establish the word's meaning is an example of a monitoring strategy. Analyzing the nature of an author's claim and judging that the text provides sufficient evidence to support the claim is an evaluation strategy.

We note that the studies reviewed by Pressley and Afflerbach (1995) generally focused on reading as comprehending a single, print text. Therefore, Table 6.1 presents a thumbnail sketch of constructively responsive reading strategies that are applicable to reading single digital texts (e.g., webpages, documents) to build a coherent understanding of information. For online readers to construct meaning from digital texts, coordinating these constructive and integrative processes is paramount. Texts are featured universally in the online world, although the materiality of text has changed from print to digital and the forms of information representation vary (Barton & Lee, 2013). As demonstrated by skilled readers' verbal reports of online reading comprehension (Cho, 2014; Coiro & Dobler, 2007), single-text comprehension strategies are still an important resource that online readers bring to their inquiries into the information and ideas, opinions and claims, and perspectives and intentions represented in digital texts. Strategic online readers analyze text information, generate various inferences to represent the meanings implied in the text, evaluate whether the text is appropriate to the goal for reading, and constantly reflect on their comprehension processes. Strategic readers adopt standards of coherence to determine whether their understanding is unified and consistent enough to fulfill their goals and needs, and therefore whether to read further or stop right there. Standards for coherence help readers manage their reading and direct it toward building a situation model of what they read on the Internet.

Constructively Responsive Strategies for Coherently Interrelating Multiple Digital Sources

As noted earlier, the Internet is fundamentally intertextual. Online readers very often face reading situations in which they must manipulate complex and numerous sets of texts, based on their goals and scopes of reading (Fox & Alexander, 2009; Hartman, Morsink, & Zheng, 2010). They do so to compare and contrast authors' perspectives, to increase the depth and breadth of their knowledge, to write reports, or to prepare for exams. How do readers comprehend more than one text, and what strategies do they deploy? In relation to this question, research has identified multiple-document reading strategies (Goldman & Scardamalia, 2013; Rouet & Britt, 2011). Readers of multiple documents are required to solve the problems related to processing not only within a single text but

TABLE 6.1. Thumbnail Sketch of Constructively Responsive Strategies for Comprehending a Single Digital Source

1. Meaning making

- Overviewing the content of digital text (webpage, websites, pdf document, etc.) to determine what is there and decide which parts to process before reading the text closely.
- Looking for important information written or visualized in text and paying greater attention to it than other information.
- Attempting to relate important points in text to one another in order to understand the text as a whole.
- Activating and using prior knowledge to interpret text, generating hypotheses about text, and predicting text content.
- Relating text content to prior knowledge, especially as part of constructing interpretations of text.
- Reconsidering and/or revising hypotheses about the meaning of text based on text content.
- Reconsidering and/or revising prior knowledge based on text content.
- Attempting to infer information not explicitly stated in text when the information is critical to comprehension of the text.
- Attempting to determine the meaning of words not understood or recognized, especially when a word seems critical to meaning construction.
- Using strategies to remember text (reviewing, summarizing, paraphrasing, self-questioning, etc.).

2. Monitoring

- Adjusting reading speed and concentration depending on the perceived importance of text to reading goals.
- Changing reading strategies when comprehension is perceived not to be proceeding smoothly.
- Reflecting on and processing text additionally after a part of text has been read or after a reading is completed (reviewing, questioning, summarizing, attempting to interpret, evaluating, considering alternative interpretations and possibly deciding between them, considering how to process the text additionally if there is a feeling it has not been understood as much as it needs to be understood, accepting one's understanding of the text, rejecting one's understanding of a text).
- Carrying on responsive conversation with the author.
- Anticipating or planning for the use of knowledge gained from reading.

3. Evaluating

- Rating the importance of text content and determining the usefulness in accordance with reading goals.
- Judging style of digital text, including word choices, sentence fluency, information organization, logical structure of main points and supporting details, visual attractiveness, easy-to-read features, and overall layout and design.
- Evaluating author's purposes, intentions, and goals based upon the anlaysis of the assumptions, worldviews, and beliefs that are often hidden in text.
- Assessing the qualities of text, with these evaluations in part affecting whether text has impact on reader's knowledge, attitudes, behavior, and so on.

Note. Adapted from Pressley and Afflerbach (1995). Copyright © 1995 Lawrence Erlbaum Associates, Inc. Adapted by permission.

also between two or more texts to understand the whole set of documents meaningfully. Perfetti, Rouet, and Britt (1999) suggested that the successful reading of multiple documents requires that readers use strategies to construct a *document model,* which is the mental representation of situated meaning from the texts. However, the document model is completed by readers' determination of meaningful relationships among texts, what is called an *intertext model*. That is, strategic readers are effortful in situating each single text within the interrelationship of multiple texts and determining specific roles and contributions of texts in the process of building the documental model.

Research exploring multiple-text reading demonstrates that a global understanding (the document model that represents intertextual meaning across the different texts) is constructed by linking and sourcing activities that include comparing, contrasting, relating, and differentiating information contained in each single text (Bråten, Anmarkrud, Brandmo, & Strømsø, 2014; Goldman et al., 2010; Rouet, 2006; Rouet & Britt, 2011; McCrudden, Stenseth, Bråten, & Strømsø, 2015). For example, strategic connecting processes serve diverse reader subgoals for learning from documents. Proficient readers relate the currently read text to previous texts, extract related information by referencing, assemble the different ideas into globally coherent meaning (Hartman, 1995), and continuously elaborate a cross-textual mental model by deploying linking strategies (Wolfe & Goldman, 2005). Effortful strategies to piece together information from each text contribute to the integrated understanding of all texts and help readers monitor their own comprehension strategies when attempting a particular reading task (Bråten & Strømsø, 2003; Strømsø & Bråten, 2002; Strømsø, Bråten, & Samuelstuen, 2003). Based on the links that they make across different texts, talented readers are not only able to build an argument model of multiple sources and contents but they also employ the model to judge the usefulness and trustworthiness of the individual documents (Rouet, Britt, Mason, & Perfetti, 1996; Rouet, Favart, Britt, & Perfetti, 1997).

Identifying and building intertextual linkages is an ongoing and recursive process. At the beginning of reading several documents, readers may concentrate on the current, single text whose reading will contribute to an initial, global representation. This representation may be referenced and revised in relation to the constructed meaning of subsequent texts. Accomplished readers strategically allocate their cognitive resources, placing increased attention on assembling meaning in different texts, then attempt to construct a mental "bird's-eye view" reflecting the global meaning structure across the texts. Comprehension may suffer when readers lack prior knowledge and possess insufficient understanding of a previous or current text. In this problematic situation, metacognitively strategic readers may find alternative ways to complement the lack of knowledge and understanding, rather than quickly judging the present text without sufficient evidence. They may revisit previous texts, slow down the speed to reread for what they didn't understand well enough, seek more information to update their content knowledge, and later try to solve the problem in the broad context constructed with intertextual connections (Anmarkrud et al., 2014; Brand-Gruwel & Stadtler, 2011; Stadtler, Scharrer, Brummernhenrich, & Bromme, 2013; van den Broek & Kendeou, 2008; Wineburg, 1991). Consequently, linking strategies during the reading of multiple texts can serve both to revise and enhance meaning construction in a manner related to (and different from) single text comprehension.

Linking strategies are pivotal for understanding multiple texts, and constructively responsive reading strategies contribute to meaning construction, monitoring comprehension, and evaluating texts at the cross-textual level of reading. Anmarkrud and colleagues

(2014) described the contributions of linking strategies to readers' better performance in reading through making meaning from multiple digital sources, evaluating different aspects of the sources, and ongoing self-monitoring of their strategic behaviors. The researchers used the framework of constructively responsive reading as a theoretical–methodological tool to examine the workings of linking strategies through the analysis of concurrent verbal reports produced by digital multidocument readers. To write an argumentative essay, the college students in this study first read within a Google-like environment that provides a finite set of digital sources. In this restricted environment, readers were allowed to locate, access, and sequence six digital sources about potential health risks of cell phone use. The sources provided different accounts of the topic and related issues from different perspectives and arguments—indicating that strategic readers ably handled inconsistent and conflicting information from across the sources. The result showed that a more extensive use of linking was substantially correlated with a more deliberate use of the sources as evidence (e.g., citing relevant sources to support the ideas) and deeper argumentative reasoning demonstrated in students' writing (e.g., including multiple perspectives and claims, resolving the disparities). The effectiveness of linking strategies increased as readers used sourcing strategies in the course of creating intertextual coherence across the sources (e.g., judging the relevance, trustworthiness, and usefulness of each source, rating source values based on the judgments). These results led researchers to conclude that there is a need for instruction to help students learn coherence-building "strategies involving systematic cross-checking, comparing, contrasting, and corroborating across documents to differentiate sources as well as integrate contents across documents" (p. 74).

Anmarkrud and his colleagues' (2014) study suggests the processes of building a documents model of multiple sources, in which an intertext model plays a central role (Perfetti et al., 1999; Rouet & Britt, 2011), can be applied to readers' strategic actions to process digital sources (Cho, 2014; DeSchryver, 2014; Goldman et al., 2012; Kobayashi, 2014). To illustrate, while gathering and learning information from multiple webpages, the reader toggles back and forth between the different webpages—by clicking on located hyperlinks, saved bookmarks, or already-opened Web-browser tabs—to grasp the focus of each page and to judge which information is consistent or conflicting. This process calls on the reader to adopt standards of coherence at two levels, which serve to determine not only what constitutes a coherent understanding of within-textual information but also what the reader identifies as a coherent interconnection of cross-textual information relevant to the task and goal (Anmarkrud, McCrudden, Bråten, & Strømsø, 2013; Rouet, 2006; Rouet & Britt, 2011). Therefore, strategies that allow critical judgments of texts, information, and sources are central to the intertextual comprehension of multiple web sources (Anmarkrud et al., 2014; Braasch et al., 2009; Cho, 2014; Goldman et al., 2012).

As seen in Table 6.2, online reading situations require readers to actively implement an array of conscious and deliberate strategies to build a coherent meaning across multiple sources they found on the Internet, in addition to processing information residing within one single text. We note that the majority of the strategies listed in Table 6.2 are very much identical to those for reading multiple texts that we identified in our original chapter of the *Handbook*. We also note that the labels of the three top-level categories were revised so as to reflect the nature of novel, complex reading environments featured on the Internet—(1) identifying intertextual links and making meanings from across multiple sources, (2) monitoring the construction of intertextual relationships, and

TABLE 6.2. Constructively Responsive Reading Comprehension Strategies for Multiple Digital Texts

1. Identifying intertextual links and making meaning from across texts

- Reading and relating the current text to recently read (prior) texts.
- Predicting contents of current text based on understanding of previous text.
- Comparing and contrasting the content of the text being read with the content of related texts to develop a coherent account of cross-textual contents.
- Generating causal inferences by searching for relationships between texts and connecting information from current text with previous text contents.
- Elaborating with information from current act of reading (of two or more texts) to understand text contents by connecting ideas between texts.
- Identifying a theme or topic across multiple texts.
- Making meanings from different multimodal texts (e.g., written paragraphs, images, charts and tables, videos) and determining contribution of each modal information (dominant mode, secondary mode, etc.) to a coherent understanding of the texts.
- Attending to an identified theme or topic across two or more texts to organize and remember this information.
- Organizing related information across texts by using related strategies (e.g., concept mapping, outlining, summarizing).
- Activating knowledge acquired in previous readings to augment comprehension of the current text.
- Noting tentative meaning of texts and searching for information in other texts to reduce the ambiguity in this tentative meaning.
- Reading sections of different texts recursively, as required to solve problems across multiple texts.
- Building increased understanding of topic by rereading the information contained in two or more texts.
- Using the increased understanding (new insights) to further learn from multiple texts.
- Taking notes to record information from current text and connect it to related information from previous texts.
- Focusing on gist information across multiple texts to recursively construct meaning.
- Rereading and linking text segments that were previously regarded as unrelated to finalize cross-textual meaning structures.
- Identifying the unique and shared contributions of information to the constructed meaning of two or more texts.
- Summarizing content of text(s) in relation to the reading task.

2. Monitoring the construction of intertextual relationships

- Managing the local processing in one or multiple texts (e.g., constructing meaning from a paragraph) and the global processing in one or multiple texts (e.g., managing the synthesis of the constructed meaning of the paragraph with all related paragraphs to account for the entire reading).
- Detecting a comprehension problem with a particular text and trying to solve the detected problem by searching for clarifying information in other available texts.
- Changing strategic processing foci from understanding within-text meaning to integrating across-text meaning by utilizing domain knowledge increased due to previous readings, during the sequential readings (i.e., decreasing links to primary endogenous resources and increasing connections to secondary endogenous resources when moving through the passages).
- Monitoring comprehension strategies and meaning construction with current text in relation to constructed meanings of other relevant texts.
- Monitoring degree and nature of comprehension of a current passage by referencing exogenous sources, using knowledge established previously (beyond the current set of documents).
- Regulating meaning construction strategies according to original task and goal and revised task and goal.

(continued)

TABLE 6.2. *(continued)*

- Perceiving that multiple texts related to the same topic can provide diverse and contrasting views about the topic, complementary information about the topic, or both.
- Managing meaning construction through understanding that different types of texts can contribute different types of knowledge to that meaning construction (i.e., primary and secondary source texts may make different contributions to the construction of meaning).
- Determining that existing content domain knowledge or expertise, including specific strategies and knowledge, can be used when studying multiple texts in a specific domain.

3. Evaluating and sourcing multiple digital texts

- Using information about a present source to evaluate and interpret text content.
- Perceiving and distinguishing the characteristics of different texts (e.g., text types, age, author, prose styles) and evaluating texts' accuracy.
- Perceiving and distinguishing the characteristics of different texts (e.g., text types, age, author, prose styles) and evaluating texts' trustworthiness based on these features.
- Perceiving and distinguishing the characteristics of different texts (e.g., text types, age, author, prose styles) and evaluating their usefulness for constructing meaning based on these features.
- Gestalt evaluation of text, employing a variety of criteria, to decide if text is useful in constructing overall meaning from several texts.
- Critically evaluating validity and reliability of texts by criteria of text contents, author's point of view, and context, using a cumulative representation of a whole document set.
- Conduct a text-to-text evaluation using a gestalt impression of each text.
- Evaluate one text in relation to another, using specific information in each text (e.g., comparing claim and evidence in two or more texts).
- Judging usefulness of information provided by a single text in relation to other text.
- Evaluating contribution of text(s) to proximal and distal reading and task goals.

(3) evaluating and sourcing multiple digital texts)—and related strategies found in new empirical work were added within each category (e.g., Anmarkrud et al., 2014; Brand-Gruwel & Stadtler, 2011; Stadtler et al., 2013).

Constructively Responsive Strategies for Building Coherent Reading Paths When Locating, Choosing, and Processing Digital Sources

Last but not least, online digital text environments require that readers build coherent reading paths. This process is the focus of a considerable amount of research in diverse fields of inquiry (Barzilai & Zohar, 2012; Biddix, Chung, & Park, 2011; Brand-Gruwel, Wopereis, & Vermetten, 2005; Cho, 2014; Cho & Afflerbach, 2015; Coiro, Coscarelli, Maykel, & Forzani, 2015; Coiro & Dobler, 2007; Goldman et al., 2012; Kuiper, Volman, & Terwel, 2008; Salmeron & Garcia, 2011; Sullivan & Puntambekar, 2015; Wopereis & van Merrienboer, 2011; Zammit, 2011; Zhang & Duke, 2008). As defined earlier, the *Internet* is a vast hypertext system of information in virtually limitless space, represented in a variety of modes and formats, including written text, images, graphics, videos, and audios, chained together by electronic links. This definition of the Internet allows us to combine the work done in both Internet reading situations and other hypertext environments. Hypertext and Internet reading represents a fundamental change in the architecture of acts of reading. With what can be called *traditional reading,* a reader interacts with a single text, applying strategies and skills with prior knowledge to construct text

meaning. This construction of meaning occurs within a problem space that allows for different single-reader–single-text interactions, but ones that may be bound by the fact of the single text. Compare this with hypertext and Internet reading in which the same reader will face a series of unknowns related to possible links, possible texts, possible decisions, and possible interactions. While readers can apply the strategies that work for traditional forms of reading, in hypertext, the reader–text(s) interactions may be more complex and demanding.

Hypertext reading presents particular challenges, and students with fewer reading strategies (or less well-developed strategies) encounter difficulties when reading in hypermedia environments. For example, searching for and locating information in hypertext requires readers' self-regulatory processes (Azevedo, Guthrie, & Seibert, 2004). A significant proportion of some students' cognitive capacity may be consumed by attempts not to "get lost" in the complex information structure of the Internet (Eveland & Dunwoody, 2000). Hypertext introduces the need for readers to control uncertainty as they move from a currently displayed text into a series of unknowns, encountering texts that may be both unhelpful and unnecessary to the task at hand (Afflerbach, Cho, & Kim, 2014). Furthermore, readers must be strategic in maintaining a focus on the task at hand in a hypertext environment that may often distract.

Reading, in the uncertain space of texts, meanings, and relations on the Internet, is marked by a process that we characterize as *realizing and constructing potential texts* to read (Afflerbach & Cho, 2009; Cho & Afflerbach, 2015). By this, we mean that the rules of reading change: No longer is there one text, a given, for the reader. Online texts remain passive objects until a reader finds value in a text, attempts to access it, makes meanings from it, and uses the meanings for a certain purpose. However, once the reader recognizes and experiments with the many possibilities, opportunities, challenges, and risks in making his or her choices, the texts become active resources for the creation of meaning (i.e., realizing potential texts). At this moment, the reader becomes an active learner in a position from which it is possible to reduce uncertainty, determine appropriate reading paths, and manage a shifting problem space (i.e., constructing potential texts). Online reading does not stop at the point that targeted information has been located, but goes further, to manage the texts, digest and reason about the texts, and make informed decisions about what texts to read and how to read them. Online readers must work to identify a series of links and texts that helps them move toward the particular goal attainment that is set prior to the commencement of reading (Naumann, 2015). There is the potential for much uncertainty given the ephemeral nature of reader choice, the degree of preciseness of search terms and strategies, and the universe of possible links to what may be related (or unrelated) texts.

Hypertext has a structure in which information units are multiply networked, and this feature demands readers' strategies for the processing of relationships among items of information (Balcytiene, 1999; Eveland & Dunwoody, 2000; Tremayne & Dunwoody, 2001; Yang, 1997; Wenger & Payne, 1996). Wenger and Payne demonstrated that for the effective learning from hypertext, readers need to attend to deciding and predicting connections that *may* exist between sites and their related information. As noted by Coiro and Dobler (2007), "The interactive and associative nature of Internet text seemed to encourage students to regularly make, confirm, and adjust inferences using strategies and structures similar to those skilled readers use in printed texts" (p. 231). In effect, inferences are educated guesses about unknowns that include the particular links, texts, and solution paths encountered during Internet reading. Readers must be able to anticipate,

then contend with the reading space and path represented by hypertexts, and not just their content.

Alexander, Kulikowich, and Jetton's (1994) finding indicates that hypertext readers tend to focus on how to access and relate textual information at the level of macroprocessing, in contrast to readers with linear text, who attend to the processing of information at the micro level. That is, during the hypertext reading, comprehenders use diverse linking activities for the construction of global meaning across networked information in hypertext. Balcytiene (1999) observed that readers who have high metacognitive skills are able to allocate their cognition to construct a global mental model presented in hypertext structure, extracting the entire volume of information and elaborating the mental representation in the relationships among sources. In this aspect, the reading of hypertext and multiple texts is related in the use of strategies for relating information scattered in a complex reading environment (Cho & Afflerbach, 2015; DeSchryver, 2014).

While there are related strategies for multiple-document reading and hypertext reading, the latter may require particular metacognitive strategies to control the reading process (Azevedo & Hadwin, 2005; Coiro & Dobler, 2007; Cho, 2014; Eveland & Dunwoody, 2000; Madrid, Van Oostendorp, & Melguizo, 2009; Taub, Azevedo, Bouchet, & Khosravifar, 2014; Tremayne & Dunwoody, 2001). This is because hypertext structure can have the characteristics of flexibility and complexity simultaneously. With hypertext, reading text is a given, but *what* text is not. Hypertext readers need to be deliberate and thoughtful to make particular choices on the path to constructing meaning, but at the same time, they must be conscious and not lose their way in the complex context in which a variety of irrelevant or seductive information may be linked, accessed, and therefore, present.

Research shows that the product and process of comprehension with hypertext or the Web are influenced by text features, such as the internal information structure (McNamara & Shapiro, 2005; Salmeron, Canas, Kintsch, & Fajardo, 2005; Schwartz, Andersen, Hong, Howard, & McGee, 2004; Shapiro, 1998, 1999) and the visualized functional structure or text format (Chen & Rada, 1996; Cuddihy & Spyridakis, 2012; Dee-Lucas & Larkin, 1995; Hofman & van Oostendorp, 1999; Lee & Tedder, 2004), as well as interaction of these features with readers' background knowledge or differences of cognitive processing (Amadieu, Tricot, & Mariné, 2010; Balcytiene, 1999; Dunser & Jirasko, 2005). The structural uniqueness of hypertext requires specific, probably unique types of reading comprehension strategies when online reading is compared with more traditional text reading.

As Alexander and colleagues (1994) noted, dynamic information presentation patterns in hypertext impose on readers a twofold responsibility, which is to construct meaning and reduce the cognitive load. Skilled readers focus on constructing meaning in reading hypertext as long as few comprehension problems are detected. In contrast, as readers perceive a disorientation, or that they are running askance of their plan, they allocate the cognitive resources to minimize the risk of hindering their comprehension and becoming detached from the original plan for reading. In other words, hypertext readers need to draw upon strategies for managing the information load to prevent disorientation (Azevedo & Cromley, 2004; Cho, 2014; Tremayne & Dunwoody, 2001). Cognitive strategies for orienting one's self in hypertext reading compete for cognitive capacity that might otherwise be devoted to comprehension of text information (Azevedo et al., 2004; Eveland & Dunwoody, 2000; Goldman et al., 2012). Skilled readers are able to balance demands for both comprehending and orienting in hypertext.

An increasing number of empirical studies has contributed to a more specified account of online reading strategies. Among the notable studies is Goldman and her colleagues' (2012) investigation of college readers' strategic performance during the task of processing multiple, hypertextual digital sources. In this study, readers self-learned using multiple websites, retrieved information with a close-ended search engine, and analyzed causal factors that explain why volcanoes erupt. These readers' verbal reports demonstrated four types of online reading strategies, including navigation, intertextual sense-making, monitoring, and information/source evaluation. As a follow-up analysis, these researchers grouped participants into more and less successful readers, based on the magnitude of change in conceptual understandings, and compared the strategic patterns that each group engaged in during the task. The result showed that better readers were more thoughtful and engaged in judging qualities of the sources they accessed, in relation to each source's reliability and usefulness in contributing to their intertextual learning. This was in stark contrast to poor readers, who quickly accepted or left a webpages and websites without critical judgments. Although the study is limited by a constrained boundary of reading (within a researcher-developed, Google-like environment), it reveals that coordination of sourcing strategies coupled with strategies for intertextual linking and monitoring is a core competence in online reading.

Cho's (2014) mixed-methods study is notable not only because it was guided by the framework of constructively responsive reading, but also because finer-grained analysis of verbal report data specified the strategies for intertextual linking, monitoring, and sourcing in the course of making informed choices of online texts. Seven highly skilled high school students performed an online reading task with a goal of creating a critical question on a socially controversial topic. The quantification of verbal report data in this study demonstrated that a scope and boundary of textual environments shape the strategic patterns. That is, readers tended to use more text-locating strategies as they read within an open-ended space of the Internet, while their foci of reading were more directed toward processing information within a limited set of websites. Additionally, the qualitative analysis of readers' verbal reports resulted in many variations and applications of constructively responsive strategies, including processing a series of links conjoined in a search-result page, managing and reducing the uncertainty of information spaces using information searching tools, conducting a dual-monitoring task of information comprehension and information management, and anticipatory and confirmatory evaluations of hyperlinks and the connected sources. It is noteworthy that Cho's study maintained ecological validity by allowing participants to navigate with unconstrained sources online and captured higher-order thinking strategies with a challenging, complex task—question formulating, problem identifying—beyond simple information location.

To conclude, recent research suggests the central importance of managing complex strategies for success in reading. Table 6.3 summarizes the constructive reading comprehension strategies used by proficient readers during the task of managing and meaning making in the complex hypertext environment. We note that the table is updated with core reading strategies for online digital text environments, reported in recent empirical work (e.g., Cho, 2014; Cho & Afflerbach, 2015; DeSchryver, 2014; Goldman et al., 2012; Salmeron & Garcia, 2011; Sullivan & Puntambekar, 2015). Furthermore, we note that strategies in Table 6.3 are different from the multiple-text comprehension strategies in Table 6.2. Table 6.3 includes a group of strategies for managing information spaces and navigating toward useful texts. These additional strategies are required for locating and selecting the texts that contribute to successful online reading as a process

TABLE 6.3. Constructively Responsive Reading Comprehension Strategies Used during the Construction of Reading Paths

1. Managing information spaces and navigating toward useful texts

- Accessing and overviewing a goal-relevant information space by searching for relevant websites or information retrieval systems.
- Reducing and managing the range of possible information to be encountered by generating and modifying search terms related to topic and focus of a particular task.
- Accessing goal-relevant websites to gain an overview and to learn possible target information, activating prior knowledge.
- Accessing complementary sources (e.g., Wikipedia, Twitter) to get background information or to survey references.
- Scrutinizing hyperlinks to anticipate and judge the usefulness and significance of the information before accessing it, based on specific reading goals.
- Exploring and sampling goal-related information in Internet hypertexts at the initial stage of reading to establish a dynamic plan to achieve one's own goal.
- Predicting utility of a link within Internet text when confronted with more than one hypertext link.
- Generating inferences about the relevance (or goodness of fit) of at least some of the other links on the pages visited prior to main act of reading.
- Reserving a website as a potential source for the current information search and later stage of reading, or reject it.
- Choosing and sequencing the reading order by accessing links based on the criteria of coherence among links and relevance to situational interests.
- Conducting complementary searches with modified or revised key words in order to better clarify suitability of links and potential reading path.

2. Building intertextual linkages and making meanings from hypertexts

- Using navigation functions to select, structure, and create environments to assist in constructing text meaning.
- Using website structures to help construct meaning.
- Using website search engines to help construct meaning.
- Searching in Internet hypertext environments for information related to already established meaning.
- Linking to additional Internet sites to obtain more information that is related to but beyond the original goal (e.g., linking to Google, then to a listed Google website, then to subsidiary websites while searching for information, because the links appear promising).
- Using multilayered inferences across the three-dimensional space of Internet hypertext to anticipate meaning of texts that are hidden from view, or to be encountered.
- Retaining information (e.g., cutting and pasting or highlighting important information) using computer and software tools.
- Backlinking and revisiting pages to revise constructed meaning.
- Revising reading goals based on experiences and progress on hypertext path to resolution.
- Combining disparate forms of information to construct meaning, including text, graphics, illustrations, and embedded video.
- Using the meaning constructed in the course of navigating and reading multiple texts to build an integrative mental model (e.g., forming, developing, modifying, and confirming a mental representation)

3. Monitoring the construction of reading paths

- Determining that an aspect of Internet hypertext reading needs attention.
- Determining that an alternative way to navigate Internet hypertext is needed because the current means of navigation is ineffective.

(continued)

TABLE 6.3. *(continued)*

- Changing search engine to navigate Internet hypertext.
- Changing search strategy to navigate Internet hypertext.
- Determining that found Internet sites are not helpful to the task or goal.
- Determining that Internet hypertext content is not comprehensible due to form, structure, new information, or a combination of these.
- Noting disorientation due to difficulty in locating specific information in Internet hypertext.
- Noting disorientation due to problems using the application functions in Internet hypertext.
- Perceiving meaning construction problems due to diversity of information encountered.
- Perceiving meaning construction problems due to volume of information encountered.
- Perceiving meaning construction problems due to managing information overload.
- Noting problems while searching for information that is expected/anticipated and perceived to be valuable but is not found or available.
- Managing disorientation by increasing memory allocation to solve the problem of disorientation.
- Managing disorientation to refocus on original search plan and goal(s).
- Realizing that original goal for reading needs revision based on Internet hypertext–reader interaction to current point in reading.

4. Evaluating and sourcing multilayered links and texts

- Evaluating the possible paths through Internet hypertext to successful completion of task(s), using standards of breadth and depth.
- Assessing relevance and usefulness of information in relation to the tentative meaning constructed through the initial and ongoing exploration.
- Assessing the credibility of information found in Internet hypertext environment (e.g., author reputation, source reliability, sponsorship, up-to-datedness, publishing types).
- Assessing the clarity of information found in Internet hypertext environment (e.g., structures, layouts, languages).
- Evaluating the Internet hypertext links that the reader accesses in relation to an imagined or proposed solution path to achieve goals, using an anticipatory "goodness of fit."
- Assessing relative value of websites and webpages that are determined to have related information.
- Evaluating URL of website to make determination of usefulness, suitability, or trustworthiness of information.
- Evaluating entry shorthand (e.g., 10 sites per page listed by Google) to make determination of usefulness, suitability, or trustworthiness.
- Evaluating nature, tone, or feel of a website and deciding to use (or not use) it.
- Evaluating the result of a search or move in Internet hypertext.

of realizing and constructing potential texts. In addition, the remaining strategies in the catalog (i.e., building intertextual linkages and making meanings from hypertext, monitoring the construction of reading paths, evaluating and sourcing multiple links and texts) are primarily used in the course of managing multilayered links, texts, and sources, in addition to dealing with a finite set of multiple texts.

In summary, online reading with hypertext systems is undertaken in many different ways, depending on the reader's decision about what texts to read, how to access and sequence texts, and when and where to limit or expand the scope of targeted texts. In the course of this process, online readers take on responsibilities for choosing and determining the sequence and order of reading (Cho, 2014; Protosalitis, 2008; Salmeron et al., 2005). They analyze the role of different modes of information representation

(e.g., writing or image) to integrate meanings coherently (Jewitt, 2006; Kress, 2003), choose the order of reading and constructing the paths that will best guide them toward achieving the goal for reading (Kaplan, 2000; Landow, 2006), and examine information qualities to access, choose, and understand relevant sources (Bruce, 2000; Buckingham, 2003). Again, standards of relevance and coherence serve the multiple dimensions of reading that require a reader's recursive moves between processing single texts, integrating multiple texts, and determining boundaries for the texts to be accessed, selected, and processed (e.g., Cho, 2014; Coiro et al., 2015; Kuiper et al., 2008; Le Bigot & Rouet, 2007; Salmeron, Kintsch, & Canas, 2006; Sullivan & Puntambekar, 2015). Acts of locating, selecting, and integrating multiple links and texts are featured in many online reading strategies.

We end this section with the observation that online readers use strategies that address the considerable task of reducing unknowns as they read. In contrast to more traditional one-reader–one-text interactions, Internet and hypertext readers must work to identify and move through a universe of many possible texts. They must ignore distractions, and anticipate and predict meaningful choices of text with minimal information. At the same time, readers must employ reading strategies that are remarkably similar to those used with more traditional text. Together, this mixture of new strategies and previously identified strategies for Internet and hypertext reading clearly reflects the role of the reader in the new architecture of reading.

Conclusions

In this chapter, we have described an evolving perspective of constructively responsive reading comprehension strategies that can address the underlying complexity of identifying, selecting, evaluating, and processing multiple, multimodal, and nonlinear texts. We revisited our account of constructively responsive comprehension strategies and incorporated newly emerging studies with the account. Our investigation demonstrates that reading strategies for single texts, multiple texts, and multilayered hypertexts that subsume multiple links, pages, and sources have considerable application to online reading that occurs in a complex textual environment. Thus, our understanding of constructively responsive reading can be regularly revised, drawing on research that describes the changing landscapes of texts encountered and mediated through the Internet, and the emerging characteristics of diverse reading environments. While the evolution of understanding reading strategies continues apace, we acknowledge the continued need to conduct research in areas that are underspecified by research. A synthesis of reading strategy research can help guide this inquiry into "new" literacies. The collection and interpretation of reader strategy data are not without challenges, but ongoing research experiences can provide good models of questions to ask and methodologies best suited to answering the questions. The challenge to describe reading strategies is met, in part, by the methodological tools used to gather data reliably and provide triangulation of information. There are numerous approaches to reading strategy data collection, and it is important to consider the unique contributions that particular methodologies can make, as well as combinations of methodologies that can provide rich datasets, strengthen our inferences, and bolster our confidence that data are describing true phenomena.

The studies synthesized here describe new frontiers in reading and new takes on known constructively responsive reading strategies. Investigations of constructively

responsive reading strategies will be well situated when they reference the existing catalog of reading strategies for guidance on strategy categorization, while simultaneously focusing on the novel or hybrid strategies that new reading situations create. We believe that the account of coherence-building processes involved in comprehending text information, managing multiple sources, and constructing reading paths and the strategies central to creating coherence demonstrate this operational dynamic. Research on reading in new and varied formats provides the opportunity to toggle back and forth between precedent and novelty as we examine strategies.

Future Directions for Research on Constructively Responsive Reading Comprehension Strategies

Future research on constructively responsive reading strategies should focus on the contextual influences on reading. The research will help us examine the claims that Internet reading requires a novel and broad set of reading strategies, and the prevalence of general reading strategies and those strategies that appear to be unique for certain reader–text(s) and task(s)–context(s) combinations. Also needed is research that describes the extent and orchestration of constructively responsive reading strategies across entire acts of reading. Research that focuses on particular types of strategies, such as prediction or summarization, can provide valuable information on such strategies. Yet it may miss the big picture of how accomplished readers coordinate their strategies, or how they negotiate an entire text (or sets of texts) in relation to task demands. Needed is focused work on reading strategies from the start to finish of acts of reading.

The frequency and amount of reading hypertexts and reading on the Internet are exploding. Leu and colleagues (2008) remind us that "never in the history of civilization have we seen a new technology adopted by so many, in so many different places, in such a short period of time" (p. 5). Given the ever-increasing membership of people who are reading Internet text and hypertext, it is imperative that we develop detailed descriptions of the manner in which reading strategies are used by readers to construct meaning. This will allow us to specify further those strategies that have universal application, those that are suited to special environments, including the Internet and hypertext, and their commonalities and idiosyncrasies.

A valuable precedent of previous reading strategy research is the attention to translating research on readers' strategies to inform instruction, so that developing readers become highly strategic (Kucan & Beck, 1997; Pressley, 2000). The connection between success in life and individuals' developed literacies is apparent, and students must be competent at reading complex text, understanding and comparing the content of several texts, and comprehending well in hypertext environments. As well, they must learn the special strategies that mark accomplished reading in particular content domains, including history and science. In particular, as the notion of coherence is foregrounded in our evolving perspective of constructively responsive reading, one intriguing area of research is to design, implement, and redesign the kind of instruction that engages student readers in using standards for coherence for successful reading with online texts. The features of learning environments and teacher scaffolding could include instructional tools to help students to recognize the importance of coherence as a guiding principle for successful reading, to develop higher standards for coherence, as is evident in accomplished readers, and to apply the standards in accordance with goals, situations, tasks, and contexts.

The literature we have reviewed emanates from different traditions and interest groups, including literacy research, cognitive psychology, information systems research, Web design research, human–computer interaction research, and information and library sciences research. It is not surprising that these groups are asking related questions and generating important results, but it is perhaps disappointing that so many efforts focused on related topics may not bear the full fruit of labor. We need to work to bring together these literatures, continue the synthesis of the important work from each tradition, and build understanding across traditions of inquiry while maintaining the particular perspectives that the efforts represent. Research on constructively responsive reading strategies will help us continue to address the issue of how new "new" literacy strategies are, or whether they are novel variations on a theme. This will carry on the strong tradition of conducting research to inform models of reading and thinking. Finally, we are hopeful that the methodological choices made by researchers will reflect the best combination of means for inquiry into reading strategy use. Just as we learn more about strategies, we should learn about the appropriateness of methodology to assist us in answering our research questions.

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