

Abstract

This study investigated whether memory for conflicting information predicted mental representation of source-content links (i.e., who said what) in a sample of 86 Norwegian adolescent readers. Participants read four texts presenting conflicting claims about sun exposure and health. With differences in gender, prior knowledge, and interest controlled for, and with self-reported critical reading strategies also included in a multiple regression analysis, it was found that the better participants remembered that the texts presented conflicting claims on the issue, the more likely they were to include source-content links in their mental representations of the texts. Theoretical and educational implications of the findings are discussed, and directions for future research are provided.

Keywords: Multiple texts, textual conflicts, sourcing, critical reading.

Memory for Textual Conflicts Predicts Sourcing When Adolescents Read Multiple Expository Texts

Introduction

When reading multiple texts to learn about controversial issues, such as whether sun exposure is healthy or harmful, disregarding source information (“who says what”) and focusing merely on content may create more confusion than clarity (Bråten & Braasch, in press; Britt, Rouet, & Braasch, 2013; Rouet, 2006). Take, for example, a layperson reading online that the claim that tanning can cause skin cancer is a hype, and that there is no compelling evidence to support that claim. At first glance, such information would probably be confusing because the person has received warnings against sunbathing from several other sources, such as the family doctor and medical experts figuring in diverse media. However, most of this confusion would likely disappear if the person notes that the information on the website is conveyed by an indoor tanning organization, as revealed when clicking on “about us” at the bottom of the page. Thus, by paying attention to the source of the information, the person would probably be able to reconcile it with information stemming from other sources, and to assign proper weight and position to this particular information in his or her global understanding of the issue.

Since Wineburg (1991) introduced the term “sourcing” in his seminal work comparing historians and high-school students trying to make sense of multiple documents on a particular historical event, sourcing has become a central construct among reading literacy researchers interested in learning from multiple texts, signifying attending to, representing, evaluating, and using source information (e.g., about the author, publication, and date of publication) in the meaning-making process (Bråten, Stadtler, & Salmerón, in press). Accordingly, several current conceptualizations of reading literacy, including the Documents

Model Framework of Britt and colleagues (Britt et al., 2013), the New Literacy Framework of Leu and colleagues (Leu, Kinzer, Coiro, Castek, & Henry, 2013), and the Disciplinary Literacy Conceptual Framework of Goldman and colleagues (Goldman et al., 2016), assume that sourcing plays a pivotal role because it allows readers to judge the trustworthiness of content in light of characteristics of the sources. This, in turn, may help readers assign proper weight and position to particular content when trying to construct coherent mental representations of controversial issues from multiple texts.

Empirical work testifies to the importance of sourcing in the reading process. Thus, a number of correlational studies have shown that the extent to which students consider trustworthiness based on source features may predict their learning and comprehension when reading about controversial issues in multiple texts (Anmarkrud, Bråten, & Strømsø, 2014; Barzilai & Eshet-Alkalai, 2015; Barzilai, Tzadok, & Eshet-Alkalai, 2015; Bråten, Strømsø, & Britt, 2009; Goldman, Braasch, Wiley, Graesser, & Brodowinska, 2012; List, Alexander, & Stephens, in press; Strømsø, Bråten, & Britt, 2010). Moreover, recent intervention work has further strengthened the idea that readers' consideration of source feature information promotes comprehension (Barzilai & Ka'adan, in press; Braasch, Bråten, Strømsø, Anmarkrud, & Ferguson, 2013; Britt & Aglinskias, 2002; Mason, Junyent, & Tornatora, 2014; Wiley et al., 2009).

Despite the theoretical and empirical importance of sourcing, relatively little is known about the textual conditions that encourage sourcing during reading (Braasch & Bråten, 2016; Bråten, Braasch, & Salmerón, 2016). However, one fruitful line of research has investigated the role of conflicting textual information, based on the rationale that when different sources make conflicting claims about a controversial situation or issue, one mechanism for resolving the resulting break in situational coherence (Graesser, Singer, & Trabasso, 1994) and constructing an integrated mental representation may be to link discrepant content information

to the respective sources (Braasch, Rouet, Vibert, & Britt, 2012). In accordance with this basic idea, termed the Discrepancy-Induced Source Comprehension or D-ISC assumption by Braasch et al. (2012), quite a few studies have indicated that the presence of conflicts may increase readers' sourcing performance (for reviews, see Braasch & Bråten, 2016; Bråten et al., in press). However, this body of research is limited because it has either focused on conflicting information presented within very brief single texts (e.g., Braasch et al., 2012; de Pereyra, Belkadi, Marbach, & Rouet, 2014; Rouet, Le Bigot, de Pereyra, & Britt, 2016; Saux, Britt, Le Bigot, Vibert, Burin, & Rouet, in press), or, when focusing on conflicting information presented across multiple texts, has included only adult undergraduate readers (Barzilai & Eshet-Alkalai, 2015; Kammerer & Gerjets, 2014; Kammerer, Kalbfell, & Gerjets, 2016; Stadtler, Scharrer, Skodzik, & Bromme, 2014; Strømsø & Bråten, 2014; Strømsø, Bråten, Britt, & Ferguson, 2013).

As an example of the first type of studies, Braasch et al. (2012) conducted two experiments where French undergraduates read two-sentence news reports containing two claims that were either conflicting or consistent. In support of the D-ISC assumption, online and offline data indicated that conflicting claims led to deeper processing and better memory for the sources of the claims than did consistent claims. As an example of the second type of studies, Kammerer et al. (2016) had German undergraduates read two web pages on a health-related issue. Based on eye movements and think alouds, those authors showed that readers presented with conflicting information paid more attention to source information and made more evaluative judgments about sources than did readers presented with consistent information. Moreover, after reading, those who previously encountered conflicting information included more references to sources in recommendations that they generated on the issue and discriminated better between more and less trustworthy sources.

To the best of our knowledge, only one study has previously investigated the role played by conflicting textual information when pre-undergraduate readers encounter more than one text. In that study, Salmerón, Macedo-Rouet, and Rouet (2016; Experiment 2) found that Spanish students at primary (5th-6th grade), secondary (7th-8th grade), and undergraduate levels who read conflicting recommendations from two different sources in a social question and answer forum took source information (i.e., expertise) into consideration when selecting which recommendation to follow and explaining their selections regardless of educational level. In contrast, students at all three educational levels tended to ignore source information when different sources did not provide conflicting recommendations (Salmerón et al., 2016; Experiment 1). Of note is, however, that participants in that study read brief recommendations dealing with daily life topics rather than multiple expository texts.

On this theoretical and empirical backdrop, we set out to investigate the contribution of memory for conflicting information to sourcing when adolescents read multiple expository texts on a particular controversial issue: the relationship between sun exposure and health (Moan, Baturaite, Juzeniene, & Porojnicu, 2012). Additionally, we extended previous research in this area by comparing the contribution of memory for conflicting information with that of self-reported critical reading strategies, which have been linked to deeper-level processing of inconsistent information in prior work (Strømsø, Bråten, & Stenseth, in press). Finally, to best isolate variance resulting from memory for conflicting information, we also wanted to control for the potential contributions of gender, prior knowledge about the topic, and interest in health issues. We considered these control variables pertinent in this context because pronounced gender differences in reading have been found among Norwegian adolescents (Kjaernslie, Lie, Olsen, & Turmo, 2004), and because prior knowledge and interest might be considered predictors of memory for conflicting information and critical reading strategies as well as for sourcing (Bråten, Anmarkrud, Brandmo, & Strømsø, 2014;

Bråten, Strømsø, & Salmerón, 2011; Stadtler et al., 2014; Stadtler, Scharrer, Brummernhenrich, & Bromme, 2013; Strømsø et al., 2010).

In summary, the present study examined the following question concerning memory for conflicting information and sourcing: Does memory for conflicting information uniquely predict sourcing when controlling for gender, prior knowledge, and interest, and, if so, is memory for conflicting information a better predictor of sourcing than are self-reported critical reading strategies? Based on prior research using very brief single texts (e.g., Braasch et al., 2012) or multiple texts with adult readers (e.g., Kammerer et al., 2016), we expected that memory for conflicting information would contribute to sourcing over and above the three control variables, thus importantly extending prior work to adolescents reading multiple expository texts presenting conflicting information on a controversial health issue. However, given that no prior study included self-reported critical reading strategies as a predictor of sourcing together with memory for conflicting information, we did not entertain any particular hypothesis regarding the relative contribution of these two predictors with other variables controlled for.

Method

Participants

Participants were 86 students (79.1% female, 20.9% male) from four classes at a public upper secondary school in southeast Norway. Their overall mean age was 16.74 ($SD = .69$). All participants were first-year students attending college preparatory courses with a specialization in arts and crafts.¹ Most of the participants (88.4%) were native-born Norwegians who learned Norwegian as a first language. In an international perspective, the sample was relatively homogeneous (i.e., middle class) with respect to socioeconomic status.

Materials

Texts. The four texts that we used presented different perspectives on sun exposure and health. This can be considered a particularly important public health issue in northerly regions where sunlight is scarce during winter and extremely attractive in summer. Moreover, the issue of sun exposure and health has personal implications for adolescent readers. For example, the Norwegian Cancer Association (2009) reported that approximately half of Norwegian youths had used a sunbed one or more times during the last year and 60% admitted they had been burned in that context. The four texts represented different kinds of authentic source materials that readers would typically encounter when seeking information about this unsettled scientific issue. This means that the texts were based on authentic materials, only slightly modified in terminology and syntax to make them more suitable for adolescent readers and in length to make them applicable in the experimental setting. At the beginning of each text, source information was presented in the form of author's name, credentials, and affiliation, as well as publication venue and date of publication.

More specifically, the four texts discussed two conflicting issues concerning sun exposure and health, one dealing with the impact of sun exposure (or the lack of it) on physical health and one dealing with the impact of sun exposure (or the lack of it) on mental health. Thus, in one pair of texts, one text argued that sun exposure is harmful because it may cause skin cancer and another text argued that sun exposure is healthy because it increases the production of vitamin D. In another pair of texts, one text argued that that lack of sun exposure may cause depression that can be treated with light therapy and another text argued that rather than depression, lack of sun exposure may lead to sleeplessness.

Thus, the first text was a 240-word article authored by a chief physician affiliated with the Norwegian Cancer Association and published in a medical journal. In this text, the causal relation between ultraviolet radiation from sunlight and sunbeds on the one hand and skin cancer on the other was highlighted and documented, and different ways of reducing the risk

of developing skin cancer were discussed (e.g., avoiding sunbeds and using sunscreen with an SPF of at least 15). The second text was a 233-word article authored by a nutritionist affiliated with the Norwegian Food Safety Authority and published in a nutrition journal. In this text, it was argued that sunlight as well as sunbeds can protect against all forms of cancer because they increase the production of vitamin D, and people were recommended to stay in the sun for some time without any sunscreen daily during the summer and to use a sunbed weekly during the winter. The third text was a 210-word article authored by a psychologist affiliated with a mental health association and published on a public health information website. In this text, it was explained that the lack of sunlight influences the amount of certain substances in the brain (i.e., serotonin and melatonin) in ways that can cause depression, and light therapy was described as an effective way to treat depression during the winter. Finally, the fourth text was a 216-word article authored by a lecturer at the Norwegian School of Sports Sciences and published on the website of the Norwegian Olympic and Paralympic Committee and Confederation of Sports. In this text, it was argued that lack of sunlight disturbs the normal diurnal rhythm and therefore can lead to sleeplessness, and it provided evidence that sleeplessness rather than depression is the main problem caused by lack of light during winter (e.g., that students in the north of Norway are not suffering from depression more than students in Italy).

As an indication of text difficulty, we used Björnsson's (1968) formula, which is based on word length and sentence length, to compute readability scores for each of the four texts. Björnsson's formula yields readability scores ranging from 20 (very easy text) to 60 (very difficult text). The readability scores for the four texts ranged from 38 to 43 ($M = 41.50$, $SD = 2.38$), which is comparable to the readability of textbooks used in Norwegian upper secondary school.

Prior knowledge measure. Participants' prior knowledge about the topic of the texts was assessed by means of a 20-item multiple-choice measure that focused on concepts and information central to sun exposure and health. Taken together, the 20 items covered both physical and mental health issues that were discussed in relation to sun exposure (or the lack of it) in the four texts (e.g., skin cancer, production of vitamin D, depression, and sleeplessness). A previous version of this measure, which has been used and validated in much prior research (e.g., Bråten et al., 2014; Ferguson & Bråten, 2013), was also reviewed by a professor of medical biochemistry at the University of Oslo. Participants' scores on the prior knowledge measure was the number of correct responses out of the 20 items. The reliability (Kuder–Richardson 20) for scores on the measure was .68.

Interest measure. We assessed participants' interest and engagement in health issues with an 8-item measure, in which participants indicated their level of interest and engagement by rating each item on a 10-point Likert-type scale ranging from 1 (not at all true of me) to 10 (very true of me). Half of the items assessed interest in health issues without reporting any active engagement or involvement (sample item: I am interested in conditions that affect our health). The other half of the items focused more on participants' active involvement and engagement in health issues, reflecting their intentions to lead healthy lives (sample item: I am concerned about how I can take care of my own health). Participants' scores on this measure had an internal consistency reliability (Cronbach's α) of .91.²

Inventory of critical reading strategies. To assess participants' likelihood of critically evaluating science-related information they may encounter in diverse media, we administered the Critical Reading of Media Reports of Science Scale (CROMROSS), recently used and validated by Strømsø et al. (in press). Three of the items on the CROMROSS were adapted from the Critical Thinking subscale of the Motivated Strategies for Learning Questionnaire (Pintrich, Smith, Garcia, & McKeachie, 1993), which was designed to measure students' use

of strategies to make critical evaluations of ideas by applying background knowledge to new situations. On the CROMROSS, however, readers were asked to rate their agreement with statements concerning how they deal with information about scientific issues presented in popular media such as newspapers, magazines, radio, television, or various websites, with all six items included in the scale addressing to what extent readers judge the plausibility of claims through critical thinking (sample item: When I see claims about new knowledge and new discoveries in the media, I consider how well justified these claims are). All six items were rated on a 5-point scale (1 = very seldom, 5 = very often). The internal consistency reliability (Cronbach's α) for participants' scores on this measure was .88.

Memory for conflicting information. Following Stadtler and colleagues (2013, 2014), we used a Conflict Verification Task (CVT) to assess students' memory for conflicting information presented in the four texts (see also, Keck, Kammerer, & Starauschek, 2015). On this task, participants were presented with 20 statements that were followed by two questions each. Both questions had to be answered "yes" or "no". The first question following each statement was "Is this claim consistent with what you read in one of the texts?" and the second question was "Did you read anything in one of the other texts that is in conflict with this claim?" Eight of the 20 statements on the CVT were paraphrases of textual claims that conflicted with a claim presented in another text ("attractor items"), eight were paraphrases of textual claims that did not conflict with a claim presented in another text ("uncritical items"), and four were claims about health issues that were neither presented in any of the texts nor were in conflict with any claim presented therein ("distractor claims"). In accordance with Stadtler et al. (2013, 2014) and Keck et al. (2015), we corrected for a tendency to answer in the positive when computing participants' scores on the CVT. Thus, each participant received a CVT score based on the difference between the proportion of the attractor items for which both questions were answered in the affirmative and the proportion of the uncritical items for

which both questions were answered in the affirmative (i.e., false positives). This resulted in CVT scores that theoretically ranged from -1 (when none of the attractor items were identified as conflicting claims and all of the uncritical items were identified as conflicting claims) to 1 (when all of the attractor items were identified as conflicting claims and none of the uncritical items were identified as uncritical claims). The internal consistency reliability (Cronbach's α) for participants' scores on the CVT was .76.

Sourcing performance task. To assess participants' ability to link text information to their respective sources, we administered the sourcing performance task used and validated by Strømsø et al. (2010; see also, Kammerer, Meier, & Stahl, in press). This task presented participants with four text sentences, one from each text, and four distractors. While each of the four text sentences presented key information from the corresponding text, the four distractors were related to the topic of sun exposure and health but their content was not covered in any of the texts. Each of the eight sentences was accompanied by five letters (A – E), with each of the first four letters (A – D) representing one of the sources and the last letter (E) representing the alternative that the content of the sentence did not come from any of the sources. The five optional letters were explained in the instruction by linking each of them to source information about a particular text or to information not found in any of the texts (e.g., A: Psychologist Anita Lund, Association for Mental Health, helsenorge.no; E: Information not located in any of the texts). Participants were instructed to mark a letter (A – D) for each key sentence to indicate the source of this information, or, alternatively, to mark a sentence E if the information did not come from any of the sources. Participants received one point for each of the eight items that they marked correctly. Internal consistency reliability (Cronbach's α) for participants' scores on this measure was .66.

Procedure

The first and third authors group administered the materials during a 45-min session that took place in participants' ordinary classrooms. Participation in the data collection was voluntary and all data were treated anonymously and confidentially.

Each participant received a folder containing all the materials. They answered a questionnaire on demographics before completing the prior knowledge measure and the interest measure in that order. After having completed these measures, participants opened a folder within the folder that contained the four texts, which were presented on separate sheets of paper. The four texts were introduced with the following instruction, also provided on a separate sheet of paper: "The relationship between sunlight and health is an important topic. Several research what kind of influence sunlight, or the lack of sunlight, may have on our health. While some are mainly concerned about physical health, others are concerned about mental health. You are now going to read four different texts about this topic. After you have read the texts, we will give you some questions to examine what you have learned about this topic. When you answer those questions, you will not be permitted to look at the texts." Of note is that the two conflicting issues (i.e., the one regarding physical health and the one regarding mental health) were presented in counterbalanced order within the text folders, as were the two texts dealing with each of these issues.

After participants had finished reading the texts and put them back into the text folder, they completed the source performance task, the conflict verification task, and the inventory of critical reading strategies, with this particular order chosen to minimize measurement reactivity (French & Sutton, 2010).

Results

Descriptive statistics for all measured variables are presented in Table 1. As can be seen, coefficients of skewness ranged from $-.95$ to $.07$. Because no score distributions were

found to be substantially skewed, they were considered suitable for use in parametric statistical analyses.

[Table 1 about here]

Table 2 shows zero-order correlations among the measured variables, with gender (males = 1, females = 2) also included in the correlation matrix. It can be seen that scores on the sourcing measure correlated positively with participants' memory for conflicting information ($r = .35, p = .001$) as well as with their self-reported critical reading strategies ($r = .26, p = .020$). Moreover, memory for conflicting information and self-reported critical reading strategies were intercorrelated ($r = .29, p = .010$). Finally, memory for conflicting information was positively correlated with prior topic knowledge ($r = .42, p = .000$), and self-reported critical reading strategies were positively correlated with interest in health issues ($r = .42, p = .000$).

[Table 2 about here]

To address our specific research question, concerning the unique and relative contribution of memory for conflicting information and self-reported critical reading strategies to sourcing performance, we performed a forced-order hierarchical multiple regression analysis. In this analysis, gender, prior knowledge, and interest were entered into the equation in step one. In step two, we included self-reported critical reading strategies (i.e., scores on the CROMROSS) and memory for conflicting information (i.e., scores on the CVT). The sourcing measure was the dependent variable in this analysis. Deletion of missing values resulted in 80 participants being available for the regression analysis.

[Table 3 about here]

Table 3 shows the results of the hierarchical regression analysis for variables predicting sourcing performance. After step one, with gender, prior knowledge, and interest in the equation, $R^2 = .04, F_{\text{change}}(3, 76) = 1.07, ns$. In this step, none of the independent variables

contributed statistically significantly to sourcing performance. After step two, with self-reported critical reading strategies and memory for conflicting information added to the prediction of sourcing by gender, prior knowledge, and interest, $R^2 = .18$, $F_{\text{change}}(2, 74) = 6.06$, $p = .004$. Thus, the addition of these variables to the equation resulted in a statistically significant 14% increment in the explained variance. In this step, only memory for conflicting information was a statistically significant predictor of sourcing, with $\beta = .29$, $p = .018$. The reason self-reported critical reading strategies did not contribute statistically significantly to sourcing performance in the regression analysis ($\beta = .21$, $p = .085$), even though the strategy variable had a positive zero-order correlation with sourcing, may be that it also correlated positively with memory for conflicting information, which was a better predictor of sourcing than were self-reported critical reading strategies. Of note is that according to Cohen's (1988) rule of thumb, 18% explained variance (Cohen's $f^2 = .22$) is considered a medium to large effect in multiple regression analysis.

Discussion

The current study contributes to the literature on “sourcing in the reading process” (Scharrer & Salmerón, 2016) by showing that memory for conflicting textual information uniquely predicts sourcing in the form of source-content representation when adolescents read multiple expository texts on a controversial scientific (i.e., health) issue. That is, even when controlling for differences in gender, prior knowledge, and interest, as well as including a measure of self-reported critical reading strategies in the regression equation, we found that the better participants remembered that the texts presented conflicting claims on the issue, the more likely they also were to include source-content links in their mental representations of the texts. Previous research has indicated that presenting adolescent (de Pereyra et al., 2014) and adult readers (Braasch et al., 2012; Rouet et al., 2016; Saux et al., in press) with conflicting information located within very brief single texts may increase their sourcing

performance. Likewise, some recent studies have indicated that the presence of conflicting information across multiple texts may lead adult readers to pay more attention to and more accurately represent information about the sources (Barzilai & Eshet-Alkalai, 2015; Kammerer et al., 2016; Kammerer & Gerjets, 2014; Stadtler et al., 2014; Strømsø & Bråten, 2014; Strømsø et al., 2013). Importantly, this study not only provides additional empirical evidence that representing conflicting content information may uniquely contribute to readers' sourcing performance, it also extends the applicability of this notion to adolescents reading multiple expository texts on a controversial health issue with public as well as personal implications.

In terms of theory, our finding is consistent with several theoretical frameworks relevant to multiple text comprehension (for review, see Bråten et al., in press). The Documents Model Framework (DMF) of Britt and colleagues (Britt et al., 2013; Britt, Perfetti, Sandak, & Rouet, 1999) explains that multiple text comprehension requires that readers integrate semantic content across texts, that is, construct a coherent mental model of the situation or issue described in the texts. The Discrepancy-Induced Source Comprehension (D-ISC) model of Braasch et al. (2012) can be conceptualized as a micro-model stemming from the DMF (Braasch & Bråten, 2016). In essence, the D-ISC model assumes that constructing a coherent mental model from multiple texts is difficult, if not impossible, when multiple sources present discrepant accounts of a situation or forward conflicting claims about an issue with no clear indication of who is right or wrong. In such instances, the D-ISC model states that to the extent that readers note and represent such discrepancies and conflicts, they will strategically shift their resources towards constructing a mental representation of the messages that also includes source feature information (e.g., about the author) as organizational components (Braasch & Bråten, 2016).

We see two particularly interesting avenues for future research that may contribute to further theoretical clarification in this area. First, because readers may be less likely to pay attention to sources embedded (i.e., cited) within single texts than to sources of multiple texts (Bråten, Strømsø, & Andreassen, 2016), future studies may compare the role of textual conflicts for sourcing when students read single texts with embedded sources versus multiple texts from different sources, with all textual content and source information kept constant across the two conditions. Moreover, a third condition might involve the reading of multiple texts from different sources that contain explicit cross-references to conflicting textual information and the other sources in the set that convey that information (cf., Stadler et al., 2014). Hopefully, such research can help clarify to what extent the presentation of conflicting claims by sources embedded in one single text rather than by multiple sources (with or without cross-references) may influence students' sourcing (Bråten & Braasch, in press).

Second, a related issue wide open for future research concerns how textual conflicts and individual differences interactively may influence readers' sourcing. As a recent example, Barzilai & Eshet-Alkalai (2015) found the effects of textual conflicts on readers' sourcing to be moderated by their thinking about knowledge and the process of knowing (i.e., their epistemic cognition; Sandoval, Greene, & Bråten, 2016). More specifically, those authors showed that presenting conflicting information across multiple texts promoted sourcing only among readers believing in uncertain knowledge and the need to justify knowledge claims through critical thinking and evidence. Further examination of how textual conflicts and individual differences interact might focus on prior knowledge (Bråten et al., in press). For example, while the contributions textual cross-references and individual differences in prior topic knowledge to sourcing have been investigated separately (Bråten et al., 2011; Stadler et al., 2014), an interesting question concerns whether any effects of including explicit cross-references on sourcing may be moderated by prior topic knowledge when people read to

comprehend multiple conflicting texts. In brief, in addition to investigating textual conflicts and individual differences separately, future research should focus on how these factors may interact to facilitate or constrain readers' sourcing activities at different educational levels.

In terms of educational practice, this study highlights the importance of helping adolescents to notice conflicting information when reading multiple expository texts because such processing, in turn, may facilitate the construction of mental representations of the issues that also take source information into consideration. In many instances, helping adolescent readers to notice textual conflicts may be more easily said than done, however. There is thus a long history of research indicating that school-aged readers may have difficulties detecting and reporting on textual conflicts (e.g., van der Schoot, Reijntjes, & van Lieshout, 2012; Garner & Krauss, 1981-1982; Wineburg, 1991). As noted by Braasch and Bråten (2016), such difficulties, among other things, may be due to lack of prior knowledge, poor reading skills, and suboptimal working memory functioning, highlighting the need to take such individual differences into consideration when designing and implementing instructional interventions. In particular, as indicated by the work of Baker and colleagues (Baker, 1984; Baker & Zimlin, 1989), teachers may profitably teach students to use comprehension monitoring strategies for noticing textual conflicts prior to presenting them with multiple conflicting texts. However, even when students are trained to notice textual conflicts and, as a consequence, become more likely to shift their attention towards source information, they may need additional training to be able to critically evaluate the sources and resolve the comprehension difficulties resulting from the textual conflicts (Braasch & Bråten, 2016).

It goes without saying that this study does not come without limitations. First, because we used correlational data collected at one time point, causal conclusions are not warranted. For example, our results do not preclude the possibility of a reciprocal relationship between memory for conflicting information and sourcing performance, or the possibility that a "third

variable” (e.g., working memory) may account for the relationship between memory for conflicting information and sourcing performance that we observed (e.g., Thompson, 2006). Thus, in this study, we simply focused on testing memory for conflicting information as a contributor to sourcing performance and observed a relationship consistent with theoretical assumptions (Braasch et al., 2012) and prior experimental work (Braasch et al., 2012; Kammerer et al., 2016) indicating that this relationship is causal.

Second, critical reading strategies were assessed by means of a self-report strategy questionnaire. While the measure that we used has been shown to produce valid strategy scores in other work (Strømsø et al., in press), on-line think-aloud protocols (Pressley & Afflerbach, 1995) should preferably be used when investigating the relative contribution of critical reading strategies in future studies.

Finally, it should be cautioned against imputing generalizability to our findings based on a Norwegian sample of secondary-school students reading about sun exposure and health. Future research on the role of textual conflicts in sourcing should therefore include school-aged readers at different educational levels that read multiple expository texts about different issues.

Despite such limitations, we remain enthusiastic about the outcome of our study because it affords implications not only for theory but also for educational practice. Textual conflicts are ubiquitous in the literacy landscape of the 21st century. Understanding their role in reading and translating this understanding into instructional activities are therefore an important research agenda within reading psychology.

Notes

¹ In Norway, compulsory primary and lower secondary schooling begins at age six and lasts for 10 years. Upper secondary education is non-compulsory and lasts for three years.

² The reason our interest measure targeted interest and engagement in health issues in general is that we assumed participants would be more likely to provide valid and reliable responses to statements regarding that issue than to statements regarding the more specific issue of sun exposure and health.

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Table 1

Means, Standard Deviations, and Coefficients of Skewness for All Measured Variables

Variable	<i>M</i>	<i>SD</i>	Skewness
Prior knowledge	12.86	3.21	-.46
Interest	6.22	1.83	-.01
Critical reading strategies	2.83	.94	.07
Memory for conflicting information	.35	.35	-.95
Sourcing performance	4.85	1.95	-.14

Table 2

Zero-Order Correlations for All Variables

Variable	1	2	3	4	5	6
1. Gender	-					
2. Prior knowledge	.04	-				
3. Interest	.07	.17	-			
4. Critical reading strategies	-.06	.16	.42***	-		
5. Memory for conflicting information	.00	.42***	.06	.29*	-	
6. Sourcing performance	.17	.11	.06	.26*	.35**	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3

Results of Hierarchical Regression Analysis for Variables Predicting Sourcing Performance

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Gender	.80	.53	.17
Prior knowledge	.06	.07	.09
Interest	.02	.12	.02
Step 2			
Gender	.90	.50	.19
Prior knowledge	-.03	.07	-.05
Interest	-.06	.12	-.06
Critical reading strategies	.44	.25	.21
Memory for conflicting information	1.63	.67	.29*

Note. $R^2 = .04$ for step 1 (*ns*), $\Delta R^2 = .14$ for step 2 ($p = .004$).

* $p < .05$.