CrossMark

Whose story is this? Discrepancy triggers readers' attention to source information in short narratives

Jean-François Rouet[1] · Ludovic Le Bigot[1] ·
Guillaume de Pereyra[1] · M. Anne Britt[2]

Abstract   Three experiments investigated the role of source information (i.e., who said what) in readers' comprehension of short informational texts. Based on the Discrepancy-Induced Source Comprehension assumption (Braasch, Rouet, Vibert, & Britt, 2012), we hypothesized that readers would be more likely to make use of source information when summarizing stories that included discrepant statements. Readers would also memorize source information more accurately. Experiments 1 and 2 found that American and French college students were more likely to refer to source information when they summarized news reports containing discrepant assertions. A detailed content analysis of the summaries also indicated that students use hedging and several other tactics to resolve contradictions. Experiment 3 replicated Braasch et al.'s finding that sources of discrepant stories were more likely to be recalled than sources of consistent stories. Experiment 3 also extended these findings using longer texts and a different reading task. Altogether the data support the Documents Model framework of multiple source comprehension.

Keywords   Text comprehension · Summary · Coherence · Discrepancy · Source

People who seek to acquire new information by reading texts often find themselves trying to understand and resolve discrepancies. Textual discrepancies may arise due to a variety of causes. In some cases, the authors of fictitious narratives may deliberately introduce factual inconsistencies as a means to surprise or puzzle the reader (Albrecht & O'Brien, 1993; Baker & Anderson, 1982). In other cases,

✉ Jean-François Rouet
  jean-francois.rouet@univ-poitiers.fr

[1] Department of Psychology, Centre National de la Recherche Scientifique, University of Poitiers, MSHS, 5 rue Théodore Lefèbvre, 86000 Poitiers, France

[2] Department of Psychology, Northern Illinois University, DeKalb, IL, USA

discrepancies arise because the available knowledge about a situation, or even the situation itself changes with time (Rapp & Kendeou, 2007; van Oostendorp, 2002). For instance, the explanation of a warehouse fire may change as police investigation reveals new evidence. In yet other cases, various parties may want to promote one-sided accounts of a situation as a function of their ideology, their interests or their interpretation of factual evidence. For instance, the owner of the warehouse and the insurance company representative may offer discrepant explanations for the fire. Because discrepancies and contradictions arise spontaneously as part of communication, skilled discourse comprehension involves not just forming coherent mental models of situations, but also identifying and resolving discrepancies within or across texts (Bråten, Strømsø, Britt, & Rouet, 2011; Bråten, Strømsø, & Salmerón, 2010; Britt, Perfetti, Sandak, & Rouet, 1999; Goldman, 2004; Perfetti, Rouet, & Britt, 1999; Rouet, Britt, Mason & Perfetti, 1996; Stadtler, Scharrer, Brummernhenrich & Bromme, 2013; Stadtler & Bromme, 2014).

An emerging body of research suggests that readers may use source information (i.e., who says what) as a means to integrate discrepant accounts of a situation when the discrepancy cannot be resolved factually. Perfetti et al. (1999) suggested that under certain circumstances, readers of multiple texts form "document models" in which specific pieces of information remain tied to their respective sources (see also Britt et al., 1999). More recently, Braasch, Rouet, Vibert and Britt (2012) have put forward the Discrepancy-Induced Source Comprehension assumption (DISC), which states that textual discrepancies may promote readers' attention and memory for sources of textual information. The present paper seeks to provide a further test of the DISC assumption, and to provide a detailed description of source-focusing versus other tactics that readers may use to resolve discrepancies (Experiment 1). In addition, we attempt to extend the scope of the DISC effect by disentangling information sources from story characters (Experiment 2), and by investigating the DISC effect on memory for sources using longer texts (Experiment 3).

In the rest of this introduction, we review previous research on the role of sources in the comprehension of texts. We also discuss current frameworks and theoretical assumptions regarding the specific role of source information in comprehending discrepant stories, including Perfetti et al.'s (1999) Documents Model framework and Braasch et al.'s (2012) DISC assumption. We then point out some limitations of existing research and present the rationale for the present study.

The role of source information in the comprehension of text

Texts are written artifacts that originate in an author's intention to communicate a message (Wineburg, 1994). Interpreting texts involves an ability to form a mental representation of what the text is about (Kintsch, 1998), but also a representation of the source of the text, i.e. who the author is, what is their purpose and intended audience, the conditions in which the text was produced (time, place, medium, intended audience and so forth; Sundar & Nass, 2001), and perhaps other details such as the surface appearance of the text or the physical context in which the text was experienced (Long & Spooner, 2010). In the context of the present study, we

limit our definition of source to a few semantic text attributes like the name and credentials of the author, the type of text, the publication medium and date, the publishing or sponsoring organization (Britt & Aglinskas, 2002; Perfetti et al., 1999; Rouet & Britt, 2014).

In most naturalistic texts, indications about the semantic source attributes can be found as adjunct materials with more or less details depending on the genre and publication standards. For instance, academic journals systematically publish the name, affiliation and contact details of each author and co-author of the papers they publish, but popular magazines do not. Information about sources can also be found within single texts, for instance when several characters issue statements about a situation (Graesser, Bowers, Olde, & Pomeroy, 1999), or when the author calls upon external information providers to document a story or an explanation (Braasch et al., 2012; Stadtler et al., 2013). Articles in newspapers and popular magazines often cite external sources of information, but usually do so through minimal reference to the role or occupation of the source (e.g., "witnesses say that…", "According to the police…").

Sources play an important part in expert readers' comprehension of texts within their area of expertise (Rouet, Favart, Britt, & Perfetti, 1997; Strømsø & Bråten, 2002; Wiley et al., 2009; Wineburg, 1991). For instance, historians grant special value to authors who provide first-hand accounts of a disputed historical event; they also tend to consider with much caution those texts whose authors have notorious ideological biases (Wineburg, 1991); history students also tend to make greater use of source information when they report on historical controversies after reading several documents, compared to students matched for education level but specializing in a different area (Rouet et al., 1997).

Whether readers with no specific expertise in the domain encode sources of information as part of their memory representation of the text has been subject to some debate. Kim and Millis (2006) reported that acquiring information from different sources decreased the recognition accuracy of story statements (Kim & Millis, 2006). However, a source memory task indicated that the participants had not encoded the source–content link, perhaps because the same pair of sources (i.e., the same two fictitious news agencies) had been used across multiple trials, thus making the link with specific content rather indistinct. Source information may then have been processed as filler or distracting information. Sparks and Rapp (2011) also found little evidence that the credibility of an information source could influence readers' processing and evaluation of inconsistent story outcomes (e.g., "joe picks up his trash when leaving the bus") following the source's description of a character's personality (e.g., "joe is messy"). The stories were presented as an interview between a reporter and a source. Both the reporter and the source provided information about the character. The source was presented as either trustworthy or untrustworthy. Manipulations of source trustworthiness had little impact on the processing of inconsistent information under regular reading instructions. Participants tended to dismiss the information provided by the source only when they were explicitly asked to rate the source for trustworthiness (Sparks & Rapp, 2011, experiment 4). In these experiments, the limited distinctiveness and rather complex

interplay of interviewer, source and character may have hindered readers' integration and use of the specific attributes of the source.

The likelihood that readers remember specific details about who said what in a text depends on the status of the source with respect to the situation. de Pereyra, Britt, Braasch, and Rouet (2014) found that information sources were more likely to be recalled if they were involved in the situation they were reporting on than if they were not involved. This finding suggests that source memory may depend on whether the sources can be included in the mental model of the situation. De Pereyra et al. (2014, experiment 2) also found that specific source-focusing instructions increased readers' memory for source–content links, a finding consistent with the view that comprehension depends on readers' standards of coherence, which themselves can be affected by contextual demands (McCrudden & Schraw, 2007; van den Broek, Risden, & Husbye-Hartmann, 1995). The specificity of source information, increased semantic and situational relatedness and a reading task focusing on the global monitoring of coherence may explain why some studies found improved memory for source information in discrepant stories (e.g., Braasch et al., 2012; de Pereyra et al., 2014), whereas other studies failed to do so (Kim & Millis, 2006; Sparks & Rapp, 2011).

Put together, the data suggest that under some conditions readers will incorporate source information (i.e., who said what) in their mental representation of a text. In the next section, we review current frameworks and theoretical assumptions regarding the conditions that promote the integration of source information in readers' memory for texts.

Theoretical accounts of source–content integration

The extant literature suggests that whether readers notice and integrate source information (i.e., who says what) together with the contents of a story depends on a number of enabling conditions. When a story does not contain any discrepant information, integration can be achieved in the form of a situation model (Kintsch, 1998). This process essentially ignores the source of the information, which then might be quickly forgotten. When a story does contain discrepant or conflicting pieces of information, readers may have different options. Stadtler and Bromme's (2014) Content–source integration model states that upon noticing a conflict, readers attempt to restore coherence either by ignoring the conflict, by reconciling the conflicting positions, or by accepting the conflict as reflecting different views that pertain to different sources. When the discrepancy cannot be easily interpreted as reflecting different sources' perspectives, the result is an inconsistent situation model (Albrecht & O'Brien, 1993). Research on the updating of mental models has found that readers will indeed tend to ignore the new, conflicting information (Johnson & Seifert, 1999), unless the text provides strong and explicit cues to updating (van Oostendorp, 2002). In those cases however, readers do not show any increased memory for sources (Kim & Millis, 2006; Sparks & Rapp, 2011). However, when the story involves different sources providing discrepant accounts of the same situation, readers may attempt to link the discrepant contents to their

respective sources, constructing a Document model (Braasch et al., 2012; Perfetti et al., 1999).

Readers' "acceptance" of the conflict and their focusing on source information as a means to integrate—if not to reconcile—discrepant statements was further theorized in Braasch et al.'s (2012) "Discrepancy-Induced Source Comprehension" (DISC) assumption. Braasch and his colleagues hypothesized that the encoding of source information together with the respective contents provides a mechanism for the reader to integrate conflicting or discrepant textual information. Thus, readers may connect a specific statement with its respective source (e.g., "according to source X, event E happened"). They may also acknowledge the contradiction between two different perspectives or viewpoints (e.g., "source X disagrees with source Y on event E") (Britt et al., 1999; Perfetti et al., 1999; Rouet, 2006, Chapter 3). Connecting content to sources would allow the reader to integrate discrepant pieces of information within a single mental model. Braasch et al. (2012) found that when reading short stories in which two sources issued conflicting statements about a situation, readers processed source information more deeply, mentioned the sources more often in their spoken summaries of the stories, and remembered source information better than when they read similar stories without a contradiction.

However, evidence supporting the DISC assumption has been thus far limited to short stories involving characters as sources of information. Furthermore, Braasch et al. (2012) found that some source information was mentioned in about 70 % of the summaries of stories that included two discrepant sources, but did not report in detail whether just one source (e.g., "the journalist claims that…"), both sources ("the journalist claims that…but the police reported that…") or just some general reference to the source(s) (e.g., "according to the sources…") was used. It is also unclear how participants managed to summarize discrepant stories without citing any source of information. Hakala and O'Brien (1995) reported that readers sometimes got around a textual inconsistency by distorting the contents, but this observation was based on materials without any source information. Thus, whether constructing a Documents model through the activation of discrepancy-induced sourcing heuristics is a means for readers to comprehend stories in which different sources provide conflicting accounts of a situation still calls for some empirical confirmation.

Rationale of the experiments

The main goal of the present study was to provide additional evidence regarding the role of source information in readers' representation of informational texts. An additional goal was to further examine how readers actually make use of source information in their written summaries. Do they cite all the available information, do they do so literally or through other linguistic devices? How do readers deal with inconsistencies when they do not cite any source information?

We addressed these questions in three experiments, using short informational texts as materials (Braasch et al., 2012; de Pereyra et al., 2014; Johnson & Seifert,

1999; Kim & Millis, 2006; van Oostendorp, 2002). In Experiments 1 and 2, we used a summarization task as a means to assess readers' gist representation of the story (Brown & Day, 1983; Goldman, Saul & Coté, 1995; Lorch, Jr., Lorch, Ritchey, McGovern, & Coleman, 2001; van den Broek & Trabasso, 1986; Wade-Stein & Kintsch, 2004). The texts were presented in print and participants were instructed to write a one-sentence summary for each story. Good summaries are usually made of reader-generated statements that condense and subsume the details of individual statements in the original text (Brown & Day, 1983; Wade-Stein & Kintsch, 2004). In contrast, other summarizing strategies such as copying or paraphrasing are considered suboptimal. Experiment 1 examined the summaries written by American Junior and Senior college students after reading short stories in which two sources presented either consistent or discrepant accounts of factual situations. Experiment 2 replicated the core findings with an extended set of items (i.e., 16 stories instead of 8), a different population (i.e., French first-year college students) and a broader range of source types (i.e., documents or organizations instead of story characters).

Experiment 3 extended the findings of previous studies by using slightly longer texts, different tasks, and a recall task. Experiment 3 aimed to test whether increased source focusing at the time of reading would result in better memory for the sources of discrepant information (Braasch et al., 2012; de Pereyra et al., 2014).

Experiment 1

The main goal of Experiment 1 was to provide a qualitative description of the strategies used by undergraduate students when asked to summarize stories containing factual discrepancies. Experiment 1 used a protocol similar to one of the conditions in the study by Braasch et al. (2012, Experiment 2). Undergraduate students were asked to read short stories and to provide a one-sentence summary of each story, with the text available. The critical stories featured two sources providing statements about a situation. In half of the cases, the statements were consistent with each other, while in the other half they were discrepant. The main prediction was that sources would be more likely to be cited in the summaries of discrepant than consistent stories. However, Experiment 1 also set out to explore the other ways in which readers could possibly resolve textual discrepancies, through a content analysis of their summaries.

Method

Participants

Participants were 29 undergraduate students (23 juniors, 6 seniors) from a Midwestern American university who participated for course credit (age range 20–42, 22 females). The data from three participants were excluded from the analysis because they failed to comply with the instructions or did not complete the procedure.

Materials

The authors created eight short narratives that described news events (science, society, economy, and so forth; see Table 1 for an example). The narratives were based on actual stories found on news websites. Each sentence contained a source (e.g., " According to a witness") and a statement (e.g. " the fire in the warehouse was caused by sabotage of an electric circuit"). The critical manipulation was the relationship between the two statements. In the consistent version (Table 1, left), the second sentence was consistent with the first one (e.g., a suspect being arrested for a suspected sabotage). In the discrepant version (Table 1, right), the first sentence and the connector were modified so that the second sentence introduced a discrepancy in the story (e.g., a suspect being arrested for an accidental fire). Note that the second sentence remained unaffected by the consistency manipulation.

Booklets were created beginning with two practice stories followed by eight target (four consistent and four discrepant) and five filler stories. The filler stories used a different rhetorical structure in order to conceal the pattern in the target items. Target stories were randomly assigned to two lists such that half the participants saw a consistent version of four target stories and a discrepant version of four other target stories. Then two list orders were created by scrambling filler and target stories, resulting in four different versions of the booklets. Each participant was randomly assigned to one version of the booklet.

Procedure

After a welcome message and short introduction to the procedure, the participants were given a booklet with the two practice stories on the first page and the critical and filler stories in the subsequent pages. The participants were instructed orally to read each story and to summarize it in a single sentence shorter than the original story. After the two practice trials, some participants were invited to read out loud their summaries. Feedback was given so as to ensure that the participants understood the need to write a single, concise summary sentence for each story. For instance, participants who had written two distinct sentences were kindly reminded

Table 1 Example of materials used in Experiments 1 and 2, with the additional sentences included in the stories for Experiment 3

	Consistent version	Discrepant version
Additional 1 (Experiment 3)	A fire at a fragrance oil warehouse that began Wednesday night still smoked with occasional spot fires	
Sentence 1	According to a witness, the fire in the warehouse was caused by sabotage of an electric circuit	According to a witness, the fire in the warehouse was caused by an accident in an electric circuit
Connector	Moreover,	Nevertheless,
Sentence 2	A local journalist affirms that a man who had been caught damaging the electric panel was arrested	
Additional 2 (Experiment 3)	There were no injuries reported	

that the task was to summarize the text in just one sentence. Then the participants proceeded to read and summarize the remaining stories at their own pace. The booklets were then collected and the participants were thanked and debriefed.

We analyzed the data in two steps. First, we content-analyzed the summaries, trying to identify the various strategies used by participants in order to summarize consistent and inconsistent stories. Second, we ran a more direct test of the DISC assumption by examining the frequency of source citation in summaries of consistent versus inconsistent stories. A descriptive analysis found no substantial difference across subgroups of participants according to the version of the booklet received. Therefore, booklet version was not considered any further in the statistical analyses. Performance on the filler items was not analyzed.

Results

Content analysis of participants' summaries

In the vast majority of the cases (n = 194, 93.3 %) the participants complied with the instructions to write a one-sentence summary. In a few cases (n = 12, 5.77 %), participants wrote two short sentences instead of just one. In two cases (.96 %) the summary was missing. All the summaries were included in the analysis. An informal, exploratory examination indicated that the participants were using four main methods to summarize the stories: sourcing, macro-summarizing, hedging and paraphrasing, as illustrated in Table 2.

Two scorers reviewed the categories, examined a few cases, and then scored the whole set of summaries independently. Inter-scorer agreement was very high (203 out of 208 cases or 98 %). Discrepancies were resolved through discussion.

The most common method of summarizing (69 cases or 33 % of total summaries) was to reflect both the contents and the sources mentioned in the stories, such as "Journalist and witness report (…)", "a witness claims (…)", or "There are conflicting reports about (…)". Source citation was not always exhaustive. Instead, the participants often summarized the sources ("there are reports…") or cited just one of the sources (see below, source citation analysis).

The next most frequent summarizing approach involved the creation of a simple macro summary of the content (e.g., "A suspect was arrested for causing a fire in a warehouse"; 56 cases or 27 % of total summaries), without any mention of the sources. In the case of a consistent story, this corresponded to extracting the gist of the story (Brown & Day, 1983). In case of an inconsistent story, however, this amounted to taking a side on the story, ignoring the discrepant statement.

The third most frequent type of summary included a hedge to mark either uncertainty (e.g., maybe, possibly) or the scope of the content (e.g., many, some) (37 cases, 18 % of total summaries). Hedging allowed participants to create a somewhat coherent model of a discrepant situation without requiring the inclusion of source information. For the example in Table 2, the conflict about there being a suspect for an accident can be resolved by questioning the certainty of the fact that the fire was an accident by including a hedge (e.g., "may have been"). Another example was the Opera story in which the art critics stated that the public loved the

Table 2 Examples of different types of summaries collected as part of Experiment 1, with the respective overall frequencies per type calculated across all items

	Example (consistent story)	Example (discrepant story)
Source citation 69 Cases, 33 %	"**Journalist and witness report** the cause of fire to be electrical sabotage." (P23) 18 Cases	"**There are conflicting reports** about the cause of the fire." (P22) "**A witness said** the fire was accidental, but a suspect was arrested." (P12) 51 Cases
Macro summary or take side 56 Cases, 27 %	"A suspect was arrested for causing a fire in a warehouse." (P29) 45 Cases	"Fire caused by circuit, suspect arrested." (P02) 11 Cases
Hedge 37 Cases, 18 %	"A suspect was arrested for **possible** arson of a warehouse." (P03) 11 Cases	"A suspect was arrested even though the fire **may have been** an electric accident." (P10) 26 Cases
Paraphrase content 33 Cases, 16 %	The fire was caused by a suspect who sabotaged a circuit and was arrested." (P05) 25 Cases	"Fire was caused by accident of electric circuit in the warehouse and the suspect was arrested." (P24) 8 Cases
Other or missing 13 Cases, 6 %	5 Cases	8 Cases

To facilitate comparison across types, all the examples represented in this table refer to the "warehouse fire" story

new show but the stage technician said that half the audience left. Several participants used a scope hedge to conclude that the two sources were talking about two different groups of audience members (e.g., "Many liked the new show at the opera, but others left before intermission", "The opera was appealing to only a select", or "The new show was successful for many, but some didn't like it").

In the fourth type of summary, participants paraphrased content by simply mentioning the content of each sentence (33 cases, 16 % of total summaries). This type of content paraphrase, while technically shorter than the original, was not really in the spirit of the task of summarizing the story (Brown & Day, 1983; Wade-Stein & Kintsch, 2004). The reduction was accomplished by eliminating the sources but not by integrating or creating a more abstract presentation of the content. In the discrepant version, a simple paraphrase of the content does not result in a coherent story (see example in Table 2).

Finally, in 13 cases (6.25 %) the summary was missing or could not be categorized in one of the four categories above. A fifth category, "Other or missing", was created to account for these cases.

Due to the relatively small number of cases per category, the influence of story version on summary type was analyzed based on the full set of responses pooled

across participants and items. A Chi Square analysis showed that the frequency of each type of summary differed significantly as a function of story version ($Chi^2(4) = 51.96$, $p < .001$). We conducted an analysis of standardized residuals (using the chisq.test function of the R software for calculating residuals, and the Bonferroni adjustment as proposed by MacDonald and Gardner, cited in Sharpe, 2015) to further examine this relationship. Sourcing was significantly more frequent in summaries of discrepant than of consistent stories (std. res. = 6.90 vs. −.69, respectively). Sources were mentioned—with varying degrees of completeness and precision, see below—in 51 summaries of discrepant stories (49 %) as opposed to 18 summaries of consistent stories (17 %). It is interesting to note that in 13 out of the 18 occasions in which participants mentioned a source in their summaries of consistent stories, they noted that the sources agreed. Examples include: "The economist and finance minister agree: antimissile shield will stimulate economy", "The protest was peaceful according to the mayor and patient", and "Technician and sociologist agree traffic cameras improve road safety". Thus, although less frequent than in the case of a discrepancy, corroborating consistent information is another reason for the reader to notice source information (Wineburg, 1991). Hedges in summaries also tended to be more common when summarizing discrepant stories (25 %) than when summarizing consistent stories (11 %), although the residuals were not significant (Sharpe, 2015). Conversely, macro-summaries were more common for consistent stories (45 cases, 44 %) than for discrepant stories (11 cases, 11 %; std. res. = 5.52 vs. −2.30, respectively). Finally, paraphrases were also more frequent for consistent stories (25 cases) than for discrepant stories (8 cases, std. res. = .92 vs. −2.99, respectively).

Source citation analysis

We further analyzed the "source" type of summaries (Table 2, top category) in order to get a more precise description of participants' sourcing strategies. As shown in Table 3, references to sources could be specific, with either a complete (as in Example 1, "store manager", "game designer") or partial (as in Example 2,

Table 3 Examples of summaries with references to source information collected in Experiment 1 in the discrepant version of the "video game" story

Story (1)	A store manager declared that the videogame industry has [not suffered/suffered] from the economic downturn. [Indeed/But] a game designer has estimated that the sales of videogames have increased by 30 % in the last 6 months

Type of reference

Specific	1. A store manager and a game designer have conflicting views on videogame sales recently
	2. A manager claims economic struggle on videogames while a designer claims otherwise
General	3. Some feel that videogame sales have decreased and others felt that they have increased
	4. Even though the videogames industry has suffered, some claim it has had a 30 % increase

(1) Both versions are presented together with the manipulated portion in bracket [consistent version/discrepant version]

Table 4 Proportion of Experiment 1 summaries containing at least one reference to a source, as a function of story consistency and type of source citation (standard deviations are in parentheses)

Story version	Consistent	Discrepant
Type of source citation		
Specific	16.35 (25.44)	39.42 (36.86)
General	0.96 (4.90)	9.62 (21.30)
Total	17.31 (28.08)	49.04 (35.69)

"manager", "designer") reinstatement of the source. In some cases, the participants used close paraphrases instead of the original source description (e.g., "the commentator" to refer to the art critic). Other summaries included more general references to sources such as "some feel" (Example 3) and "some claim" (Example 4). Because the task was to summarize, general references were consistent with the task and therefore not unexpected. As shown in Table 4, general references were actually infrequent. Therefore we collapsed both specific and general references to create a source citation total. For each participant and each item, we counted the number of summaries that contained at least one reference to a source.

The data were analyzed using mixed effect logistic regression analysis, with story version as an independent categorical variable. The consistent version was chosen as a reference level. The glmer from package lme4 of the R software was used to conduct the analyses. A model including item and participant random intercepts showed that sources were more likely to be included in summaries when the stories were discrepant than when they were consistent (*OR* 10.90, 95 % *CI* [4.42; 31.45], z = 5.37, *p* < .001).

Although the effect of story discrepancy on source citation was apparent in all 8 items, the overall level of source citation varied from 23 % ("Opera show" story) to 55 % ("Protest" story). Similarly, the number of summaries including at least one reference to a source ranged form zero (4 participants) to all 8 items (1 participant). Thus, both story content and participant characteristics had a substantial influence on the overall level of sourcing, but these influences did not overcast the main DISC effect.

Discussion

The main purpose of Experiment 1 was to examine students' strategies when summarizing short narratives containing discrepancies. Consistent with Braasch et al.'s (2012) DISC, we found that source citation was infrequent in the summaries of the consistent versions of the narratives, but occurred in about half of the summaries of discrepant versions. We also found that readers of discrepant texts tended to hedge the content of the text in order to minimize or to explain the discrepancy. In contrast, consistent texts were summarized using macro-statements or paraphrasing some of the contents. Since consistent and discrepant narratives dealt with identical topics and differed in only a few words and phrases (Table 1),

the effect is unlikely to be related to the contents of the stories or any other bias in the materials.

The observed increase in source citation for discrepant texts supports the view that readers use source information to organize the representation of textual contents when the contents cannot be easily integrated into a single, coherent situation model, i.e., a core assumption of the Documents Model framework (Britt et al., 1999; Perfetti et al., 1999). Linking discrepant statements to their respective sources allows readers to integrate information without having to alter the original facts. One limitation of the present study, however, is that sources of information were always human characters with a plausible relationship to the situation described in the narrative (e.g., an art critic and a stage technician commenting the success of a show). Human agents are just one of the many categories of entities that pertain to the construct of source (Sundar & Nass, 2001). Furthermore, a disagreement among characters may prompt the reader to elaborate on the characters as agents in the story, rather than as sources of information. For instance, readers may try to explain the discrepancy by elaborating on the character's intentions (e.g., "why did this art critic hate the show?"), which would make the characters more central and increase their citation rate in the summaries (see e.g., Graesser et al., 1999, on textual features that make characters more memorable as sources of information). In addition, de Pereyra et al. (2014) have found that characters that are close to the situation tend to be recalled better than those who are more remote. Thus there is a need to disentangle the source discrepancy effect from a mere character centrality or salience effect. In Experiment 2, animate sources were compared with inanimate ones, such as documents or organizations.

Experiment 2

The main goal of Experiment 2 was to replicate the findings of Experiment 1 with a larger and more varied set of stories, including animate as well as inanimate sources of information. Experiment 1 used characters as sources. As noted above, the discrepancy may have made the characters more salient, which would also explain why they would be included in a gist representation of the story. In Experiment 2, we included both animated and inanimate sources to test whether the discrepancy effect holds for both types of sources. According to the Documents Model framework (Perfetti et al., 1999), various features of the source, including document type can be included in the readers' "intertext model" (Britt et al., 1999). Consequently, we predicted that sources would be cited more frequently in the summaries of the discrepant as opposed to the consistent version of the stories, and this effect would be independent of source animacy.

To further extend the findings, Experiment 2 was conducted with materials written in a language other than English, and a sample of less experienced university students from a different country. The students in Experiment 1 were American

Juniors and Seniors, that is, in their third or fourth year as university students, respectively. They may have learned to use sourcing heuristics through academic experience (Rouet et al., 1997; Wineburg, 1991). Experiment 2 aimed at verifying whether less experienced undergraduate students would display a similar increase in source citation when faced with the task of summarizing discrepant stories.

Method

Participants

Twenty-four French first-year university students (21 female, age range 18–21) enrolled in a psychology program participated in a single session of about 1 h in exchange for course credit.

Materials

Eight additional target stories and 3 additional filler stories were created to supplement the set of stories used in Experiment 1. In order to rule out a possible confound of sources and agents in the stories, two alternate sets of sources were prepared for each story. Alternate sources were inanimate, i.e. they did not refer to individual agents, but were instead either documents or organizations. For instance, "the arts chronicle" and "the theater bulletin" were inanimate replacement sources for "the art critic" and the "stage technician" in the Opera story.

The stories were assembled in booklets containing eight consistent, eight discrepant and eight filler stories arranged in a random order. In addition, half the critical stories were presented with animate and half with inanimate sources. Finally, for half the stories, the order of presentation of sources within the story was reversed. Thus, there were eight versions of the booklets in total, and each story statement appeared with four different sources across booklets. Filler stories were randomly interspersed within critical stories so as to introduce some variation in the rhetorical structure of the stories throughout the booklet.

Procedure

The procedure was similar to that of Experiment 1. The experiment was run in small groups of 5–10 participants. After a welcome message and some information regarding the procedure, the participants were given a booklet with the two practice stories followed by 24 stories including 16 critical (8 consistent, 8 discrepant) and 8 filler stories presented in a random order. They were orally instructed to read each story carefully and to summarize it in just one short sentence. The participants were given approximately 40 min to read the 24 stories and write a one-sentence summary for each of them. Performance was similar across booklet versions, therefore counterbalancing was not considered any further in the statistical analyses. The summaries of filler stories were not analyzed.

Results

Scoring

The summaries were scored for any mention of source information, either literal or indirect, using the same scoring rubric as in Experiment 1. The same two scorers as in Experiment 1 informally discussed a dozen of examples and then scored independently 40 summaries with a perfect agreement. The rest of the protocols were scored by one of the scorers.

Source citation as a function of story consistency and source type

Sources were cited in about one quarter of the summaries (24.74 %). In line with the DISC assumption, source citation varied sharply across story versions. As shown in Table 5, the proportion of summaries containing at least one source citation increased from the consistent (13 %) to the discrepant versions of the stories (36.5 %), regardless of the type of sources (animate, inanimate).

The data were analyzed through a mixed-effect logistic regression analysis with story version and source animacy as independent categorical variables. "Consistent version" and "inanimate source" were used as reference levels. A model taking into account the random intercepts for participants and items showed that sources were cited more often in summaries of discrepant than in consistent stories (consistent stories as reference, (OR 5.44, 95 % CI [2.41; 13.19], $z = 4.01$, $p < .001$). Source animacy had no significant main effect (OR 1.29 95 % CI [0.51; 3.32], $z = 0.54$, $p = 0.59$) and no significant interaction with source animacy (OR 0.95, 95 % CI [0.30; 3.00], $z = -0.08$, $p = .94$).

Just like in Experiment 1, we found some variation in the overall level of sourcing according to both text contents and individuals. The percentage of summaries including at least one reference to a source ranged from 8 to 62.5 % depending on the story. One participant never cited a single source in her summaries, whereas another participant included sources in 68.7 % of hers. However, the increase in source citation for discrepant versions was verified for 13 out of 16 stories (81 %) and for 19 out of 24 participants (79 %). Thus, the effect was both large and robust.

Table 5 Proportion of Experiment 2 summaries containing at least one reference to a source, as a function of story consistency and type of source (standard deviations are in parentheses)

Story version	Consistent	Discrepant
Animate source		
Specific	10.42 (15.05)	29.17 (28.23)
General	4.16 (14.12)	9.37 (17.77)
Total	14.58 (20.74)	38.54 (27.56)
Inanimate source		
Specific	10.42 (19.39)	26.04 (22.70)
General	1.04 (5.10)	8.34 (12.04)
Total	11.46 (19.48)	34.38 (23.09)

Discussion

Experiment 2 aimed at replicating Experiment 1 with texts and participants working in another language and with a broader diversity of sources. Indeed, the participants in Experiment 2 were much more likely to include source information in their summaries when they read the texts in their discrepant than in their consistent version. In addition, participants' reliance on source information to account for discrepant narratives extended across animate and inanimate sources.

The participants in Experiment 2 mentioned source information in 13 % of their summaries of the consistent texts and 36.5 % for the discrepant ones. This is in the same range, although somewhat lower than the figures observed in Experiment 1 (17 and 49 %, respectively). One obvious difference across experiments is the type of undergraduate population that was recruited. Whereas participants in Experiment 1 were mostly Juniors and Seniors (i.e., typically in their third or fourth year of college education), those in Experiment 1 were all Freshmen (i.e., in their first year). The lack of an independent measure of sensitivity to information sources or other relevant dimensions of individual differences such as epistemic beliefs (Kammerer, Bråten, Gerjets, & Strømsø, 2013) precludes any firm conclusion. However, since previous studies have found that attention to sources may increase with academic experience (e.g., Wineburg, 1991), it may be suggested that sampling differences may account for the difference in overall source citation.

Experiment 2 also suggests that sources are used as an organizing scheme independent from their status as agents in the story (Graesser et al., 1999). Inanimate sources were cited as frequently as animate sources. When cited, sources were often connected to contents through rhetorical predicates, e.g., "according to x", "x says". On other occasions, readers summarized the story by simply stating that the two sources gave two conflicting accounts. This finding suggests that when readers encounter discrepant information provided by multiple sources, they may acknowledge the relativity of information and engage in the construction of a documents model, as opposed to a simpler situation model (Britt et al., 1999; Perfetti et al., 1999).

Experiment 3

In Experiments 1 and 2, we used a written summarization task similar to the original study by Braasch et al. (2012, experiment 2). We found that participants were more likely to include source information in their written summaries when the stories featured discrepant claims than when the claims were consistent. This finding may be interpreted as evidence that sources of discrepant claims are more likely to be integrated in the reader's gist representation of a narrative, which is consistent with the Documents Model framework (Britt et al., 1999; Perfetti et al., 1999). However, the participants had the texts available at the time of writing their summaries, and thus no claim can be made from the data as regards their memory representation of the story. The goal of Experiment 3 was to further replicate Braasch et al.'s (2012) study by investigating readers' recall of source information after a short delay. We

tested the assumption that information sources (i.e., who said what) would be better recalled after reading the discrepant versus the consistent versions of the stories. We also aimed at extending prior experiments by using longer stories and a different reading task.

Method

Participants

Thirty-five US undergraduates enrolled in an introductory psychology course (22 males, 13 females, age range 18–32) participated for course credit. Nineteen were freshmen, 10 were sophomores, 4 were juniors and 2 were seniors.

Materials

Several modifications were made to the materials from Experiment 1. First, the stories were lengthened to make the source information less salient. As shown at the bottom of Table 1, a neutral filler sentence was added to both the beginning and end of the stories. Care was taken to make sure the final sentence was not a continuation of either perspective of the situation. The second change to the materials was that the number of filler stories was increased from 5 to 8. The booklet had two practice items followed by eight extended target stories (four consistent and four inconsistent) and eight filler stories.

Procedure

The participants were run in small groups. They were asked to read each news story for comprehension. Because the reading goal was comprehension, a question was asked to make sure participants were reading the stories. They were asked to briefly state what the story was about on the blank lines following each story (data from this task were not analyzed). Then the participants were given a 5-min word search task followed by a surprise cued recall task. In this task, they were given the eight target stories with blanks for the critical content, the connector, and the source information. An example is presented in Table 6. Participants were asked to "fill in as much of the missing information as you can. Try to write in anything you can recall even if you have to guess". The task was not timed.

Performance was comparable across booklet versions, and this variable was not considered further. Filler items were not analyzed.

Table 6 Example of the cued recall task used in Experiment 3

A fire at a fragrance oil warehouse that began Wednesday night still smoked with occasional spot fires. _____, the fire in the warehouse was caused by _____. _____, _____ affirms that a man who had been caught damaging the electric panel _____. There were no injuries reported

Results

Recall of source information was scored by one of the researchers using the same scoring rubric as in Experiments 1 and 2. Participants had to explicitly mention the main noun of the source (e.g., witness, journalist) or a close synonym in order for recall to be credited. Out of 140 trials involving consistent stories, participants failed to recall any source in 107 cases (76 %). They recalled one source in 29 trials (21 %) and both sources in 4 trials (3 %). In contrast, out of 140 trials involving discrepant stories, participants recalled one source in 56 cases (40 %) and both sources in 16 additional cases (11 %). The data were analyzed using mixed effect logistic regression analysis, with story version as an independent categorical variable, and the inclusion of at least one source in the summary as a binary dependent variable. The consistent version was chosen as a reference level. The glmer function from package lme4 of the R software was used to conduct the analyses. A model including item and participant random intercepts showed that the summaries were more likely to include at least one source when the stories were discrepant than when they were consistent (*OR* 4.74, 95 % *CI* [2.62; 8.95], z = 4.99, *p* < .001). A second mixed-model analysis using the recall of both sources as a criterion led to the same conclusions. Additional analyses found that content recall was unaffected by the discrepancy manipulation. For purposes of brevity, these analyses are not reported.

Discussion

Experiment 3 provided additional support to the source memory prediction using longer stories and a general comprehension task. The finding that information sources are better recalled when they provide discrepant information suggests that sources participate in the construction of a long-term memory representation of the text, presumably because they contribute to establishing coherence at a rhetorical level (i.e., who says what) when coherence cannot be achieved at a situational level (i.e., what happened). This finding lends additional support to Braasch et al.'s (2012) DISC assumption, and more generally to the Documents Model framework (Perfetti et al., 1999; see also de Pereyra et al., 2014).

General discussion and conclusions

Previous studies of multiple text comprehension have found that sources are important when comprehending multiple texts (Rouet et al., 1996, 1997; Stadtler et al., 2013; Strømsø, Bråten, & Britt, 2010). It has been suggested that sources may also play an important part in the comprehension of simpler texts such as short news reports (Braasch et al., 2012; de Pereyra et al., 2014). More specifically, the integration of sources and contents has been found to play a part in readers' comprehension of texts containing discrepant statements attributed to different sources (Discrepancy-Induced Source Comprehension assumption or DISC, Braasch et al., 2012). The purpose of the present study was to contribute to this

emerging body of evidence by demonstrating that source-focusing mechanisms also apply in a situation where readers with no specific prior knowledge read simple stories about everyday events. More specifically, the three experiments tested the assumptions that (a) sources are more likely to participate in the readers' gist representation of a text when the story contains a discrepancy (b) that sources providing discrepant information are better remembered than sources providing consistent statements.

Experiments 1 and 2 fully supported those predictions, using materials in two languages and participant samples drawn from two different countries. In Experiment 1, we found that junior and senior American undergraduate students were much more likely to cite sources in their summaries of short news stories when the stories conveyed discrepancies. The discrepancy manipulation affected only one content phrase in the first sentence and a connective, and thus the contradictory versus non-contradictory versions of the stories were very similar. Nevertheless the structure of the one-sentence summaries was deeply affected by the manipulation. The participants cited sources in 49 % of the summaries of discrepant stories versus a mere 17 % of the consistent stories. In Experiment 2, the same pattern of results was observed with French undergraduates. In addition, sources were used in the summaries regardless of whether they were animate agents or inanimate entities. Those experiments suggest that upon noticing the discrepancy, readers often constructed a representation of the situation that included the sources connected to their respective contents. This is consistent with Braasch et al.'s (2012) DISC assumption and more generally with the Documents Model framework (Britt et al., 1999; Perfetti et al., 1999).

Experiment 3 replicated those findings and demonstrated that sources were more likely to be recalled when the story contained a discrepancy. This additional finding confirms that source information is actually encoded as part of the readers' memory representation, as opposed to simply being used at the time of summary writing.

The experiments presented in this paper contribute to a growing body of evidence that readers focus on source information when encountering discrepant information about a situation (Braasch et al., 2012; de Pereyra et al., 2014). Theories of discourse processing (e.g., Kintsch, 1998; O'Brien, Rizzella, Albrecht, & Halleran, 1998; van den Broek, Risden, & Husbye-Hartmann, 1995; Zwaan, Magliano, & Graesser, 1995) have specified what information gets activated during text processing and what dimensions are monitored when forming a coherent situation model (e.g., who, what, where, why, see Zwaan & Radvansky, 1998). The Documents Model framework (Perfetti et al., 1999) provides an additional integration mechanism that operates when coherence-based integration is impossible or undesirable. Moreover, contrary to other studies showing that source memory is generally low (e.g., Sparks & Rapp, 2011), or sometimes even antagonist to content integration (e.g., Kim & Millis, 2006), we found that readers tend to focus on source information when they need to integrate discrepant contents. It should be noted that, unlike previous studies of sourcing by Kim and Millis (2006) or Sparks and Rapp (2011), the sources used in our materials were distinctive and specific to the events presented in the stories. The availability of sources that can be integrated

within one's mental model of the situation may thus be a condition for the application of the DISC mechanism (Braasch et al., 2012; de Pereyra et al., 2014).

We do not claim, however, that integrating source and content information is a generalized mechanism that would be easily accessible to all readers in any reading situation. In fact, just as in previous studies, our Experiment 1 found that students frequently got around the inconsistency by distorting the contents, taking a side, or simply ignoring the inconsistency (see also Hakala and O'Brien 1995). Furthermore, we used simple stories including clear-cut, direct contradictions. In contrast, students are often used to study lengthier, multiple texts, in which discrepancies may be much less obvious (Stadtler & Bromme, 2014). Our findings to not warrant any conclusion regarding the role of source information in comprehending information from texts longer than those used in Experiment 3 (though see Keck et al., 2015; Stadtler et al., 2013 for evidence in that direction). Finally, the range of reading contexts in which lay readers are likely to turn to source information to interpret conflicting or discrepant information remains to be further assessed.

It should be noted at this point that our use of source citation in participants' written summaries may be deemed a rather conservative estimate of the actual use of sources in comprehending conflicting stories. Participants may have used source information *implicitly* in any of the summary methods evidenced in Experiments 1 and 2. For instance, they could have used the source to decide which side they aligned with, dismissed or hedged. We also need to assess whether and how source features such as expertise or trustworthiness will affect readers' decisions to retain sources as valid when acquiring a representation of an uncertain or conflicting situation.

The study entails a number of limitations that restrict the generality and call for further confirmation of the findings. First, we have used short and simple stories with rather blatant discrepancies between the two sources. It is unclear if the DISC assumption would hold for longer texts and less obvious contradictions. Variations in the presentation of the information may also affect readers' strategies. For instance, Stadtler, Scharrer, and Bromme (2011) found that the detection of conflicts depends on both a high-coherence orienting goal and the presentation of rhetorical cues to the conflict in the text (see also Stadtler et al., 2013).

We believe that the experiments presented in this paper contribute to a better understanding of how readers handle discrepancies as they read about controversial or debated topics. Discrepancies are often related to multiple sources' perspectives, biases and interpretations of events and explanations. In those cases, coherence-based cognitive mechanisms may be supplemented by additional integration mechanisms such as those proposed in the Documents Model framework. Our study provides additional support in favor of one of these mechanisms, i.e., readers' encoding and integration of source information with the respective contents (Braasch et al., 2012; de Pereyra et al., 2014). Further research will be needed in order to fully uncover how semantic, social and pragmatic levels of understanding contribute to readers' comprehension of written information.

References

Albrecht, J. E., & O'Brien, E. J. (1993). Updating a mental model: Maintaining both local and global coherence. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 19*, 1061–1070.

Baker, L., & Anderson, R. I. (1982). Effects of inconsistent information on text processing: Evidence for comprehension monitoring. *Reading Research Quarterly, 17*, 281–294.

Braasch, J. L. G., Rouet, J.-F., Vibert, N., & Britt, M. A. (2012). Readers' use of source information in text comprehension. *Memory and Cognition, 40*, 450–465. doi:10.3758/s13421-011-0160-6.

Bråten, I., Strømsø, H., Britt, M. A., & Rouet, J.-F. (2011). The role of epistemic beliefs in the comprehension of multiple expository texts: Towards an integrated model. *Educational Psychologist, 46*, 48–70.

Bråten, I., Strømsø, H., & Salmerón, L. (2010). Trust and mistrust when students read multiple information sources about climate change. *Learning and Instruction, 21*, 180–192.

Britt, M. A., & Aglinskas, C. (2002). Improving students' ability to identify and use source information. *Cognition and Instruction, 20*, 485–522.

Britt, M. A., Perfetti, C. A., Sandak, R., & Rouet, J. F. (1999). Content integration and source separation in learning from multiple texts. In S. R. Goldman, A. C. Graesser, & P. van den Broek (Eds.), *Narrative comprehension, causality, and coherence: Essays in honor of Tom Trabasso* (pp. 209–233). Mahwah, NJ: Lawrence Erlbaum Associates.

Brown, A. L., & Day, J. D. (1983). Macrorules for summarizing texts: The development of expertise. *Journal of Verbal Learning and Verbal Behavior, 22*, 1–14.

de Pereyra, G., Britt, M. A., Braasch, J. L. G., & Rouet, J. F. (2014). Reader's memory for information sources in simple news stories: Effects of text and task features. *Journal of Cognitive Psychology, 24*(2), 187–204. doi:10.1080/20445911.2013.879152.

Goldman, S. R. (2004). Cognitive aspects of constructing meaning through and across multiple texts. In N. Shuart-Ferris & D. M. Bloome (Eds.), *Uses of intertextuality in classroom and educational research* (pp. 313–347). Greenwich, CT: Information Age Publishing.

Goldman, S. R., Saul, E. U., & Coté, N. (1995). Paragraphing, reader, and task effects on discourse comprehension. *Discourse Processes, 20*, 273–305.

Graesser, A. C., Bowers, C., Olde, B., & Pomeroy, V. (1999). Who said what? Source memory for narrator and character agents in literary short stories. *Journal of Educational Psychology, 91*, 284–300.

Hakala, C. M., & O'Brien, E. J. (1995). Strategies for resolving coherence breaks in reading. *Discourse Processes, 20*, 167–185.

Johnson, H. M., & Seifert, C. M. (1999). Modifying mental representations: Comprehending corrections. In H. van Oostendorp & S. Goldman (Eds.), *The construction of mental representations during reading* (pp. 303–318). Mahwah, NJ: Erlbaum.

Kammerer, Y., Bråten, I., Gerjets, P., & Strømsø, H. I. (2013). The role of Internet-specific epistemic beliefs in laypersons' source evaluations and decisions during Web search on a medical issue. *Computers in Human Behavior, 29*, 1193–1203.

Keck, D., Kammerer, Y., & Starauschek, E. (2015). Reading science texts online: Does source information influence the identification of contradictions within texts? *Computers & Education, 82*, 442–449.

Kim, H. J. J., & Millis, K. (2006). The influence of sourcing and relatedness on event integration. *Discourse Processes, 41*, 51–65.

Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge, MA: Cambridge University Press.

Long, D. L., & Spooner, A. (2010). Placing a text in context. *Psychonomic Bulletin & Review, 17*, 237–242.

Lorch, R. F, Jr, Lorch, E. P., Ritchey, K., McGovern, L., & Coleman, D. (2001). Effects of headings on text sumarization. *Contemporary Educational Psychology, 26*, 171–191.

McCrudden, M. T., & Schraw, G. (2007). Relevance and goal-focusing in text processing. *Educational Psychology Review, 19*, 113–139.

O'Brien, E. J., Rizzella, M. L., Albrecht, J. E., & Halleran, J. G. (1998). Updating a situation model: A resonance text processing view. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 24*, 1200–1210.

Perfetti, C. A., Rouet, J.-F., & Britt, M. A. (1999). Towards a theory of documents representation. In H. van Oostendorp & S. Goldman (Eds.), *The construction of mental representations during reading* (pp. 99–122). Mahwah, NJ: Erlbaum.

Rapp, D. N., & Kendeou, P. (2007). Revising what readers know: Updating text representations during narrative comprehension. *Memory and Cognition, 36*, 479–494.

Rouet, J.-F. (2006). *The skills of document use: From text comprehension to web-based learning.* Mahwah, NJ: Erlbaum.

Rouet, J.-F., & Britt, M. A. (2014). Learning from multiple documents. In R. E. Mayer (Ed.), *Cambridge handbook of multimedia learning* (2nd ed., pp. 813–841). Cambridge, MA: Cambridge University Press.

Rouet, J.-F., Britt, M. A., Mason, R. A., & Perfetti, C. A. (1996). Using multiple sources of evidence to reason about history. *Journal of Educational Psychology, 88*(3), 478–493.

Rouet, J.-F., Favart, M., Britt, M. A., & Perfetti, C. A. (1997). Studying and using multiple documents in history: Effects of discipline expertise. *Cognition and Instruction, 15*, 85–106.

Sharpe, D. (2015). Your Chi Square test is statistically significant: Now what? *Practical Assessment, Research & Evaluation, 20*(8). http://pareonline.net/getvn.asp?v=20&n=8.

Sparks, J. R., & Rapp, D. N. (2011). Readers' reliance on source credibility in the service of comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 37*, 230–247.

Stadtler, M., & Bromme, R. (2014). The content–source integration model: A taxonomic description of how readers comprehend conflicting scientific information. In D. N. Rapp & J. Braasch (Eds.), *Processing inaccurate information: Theoretical and applied perspectives from cognitive science and the educational sciences* (pp. 379–402). Cambridge, MA: MIT Press.

Stadtler, M., Scharrer, L., & Bromme, R. (2011). How reading goals and rhetorical signals influence recipients' recognition of intertextual conflicts. In L. Carlson, C. Hoelscher, & T. F. Shipley (Eds.), *Proceedings of the 33rd annual conference of the Cognitive Science Society* (pp. 1346–1351). Austin, TX: Cognitive Science Society.

Stadtler, M., Scharrer, L., Brummernhenrich, B., & Bromme, R. (2013). Dealing with uncertainty: Readers' memory for and use of conflicting information from science texts as function of presentation format and source expertise. *Cognition and Instruction, 31*, 130–150.

Strømsø, H. I., & Bråten, I. (2002). Norwegian students' use of multiple sources while reading expository texts. *Reading Research Quarterly, 37*, 208–227.

Strømsø, H. I., Bråten, I., & Britt, M. A. (2010). Reading multiple texts about climate change: The relationship between memory for sources and text comprehension. *Learning and Instruction, 20*, 192–204.

Sundar, S. S., & Nass, C. (2001). Conceptualizing sources in online news. *Journal of Communication, 51*, 52–72. doi:10.1111/j.1460-2466.2001.tb02872.x.

van den Broek, P., Risden, K., & Husbye-Hartmann, E. (1995). The role of readers' standards of coherence in the generation of inferences during reading. In R. F. Lorch Jr & E. J. O'Brien (Eds.), *Sources of coherence in text comprehension* (pp. 353–373). Hillsdale, NJ: Erlbaum.

van den Broek, P., & Trabasso, T. (1986). Causal networks versus goal hierarchies in summarizing text. *Discourse Processes, 9*, 1–15.

van Oostendorp, H. (2002). Updating mental representations during reading scientific text. In J. Otero, J. A. Leon, & A. C. Graesser (Eds.), *The psychology of science text comprehension* (pp. 417–436). Mahwah, NJ: Lawrence Erlbaum Associates.

Wade-Stein, D., & Kintsch, E. (2004). Summary street: Interactive computer support for writing. *Cognition and Instruction, 22*, 333–362.

Wiley, J., Goldman, S. R., Graesser, A. C., Sanchez, C. A., Ash, I. K., & Hemmerich, J. A. (2009). Source evaluation, comprehension, and learning in internet science inquiry tasks. *American Educational Research Journal, 46*, 1060–1106.

Wineburg, S. S. (1991). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. *Journal of Educational Psychology, 83*, 73–87.

Wineburg, S. S. (1994). The cognitive representation of historical texts. In G. Leinhardt, I. Beck, & C. Stainton (Eds.), *Teaching and learning in history* (pp. 85–135). Hillsdale, NJ: Erlbaum.

Zwaan, R. A., Magliano, J. P., & Graesser, A. C. (1995). Dimensions of situation model construction in narrative comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 21*, 386–397.

Zwaan, R. A., & Radvansky, G. A. (1998). Situation models in language comprehension and memory. *Psychological Bulletin, 123*, 162–185.