Why Are Some Texts Good and Others Not? Relationship Between Text Quality and Management of the Writing Processes

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Two experiments examined whether text quality is related to online management of the writing processes. Experiment 1 focused on the relationship between online management and text quality in narrative and argumentative texts. Experiment 2 investigated how this relationship might be affected by a goal emphasizing text quality. In both experiments, psychology students were instructed to think aloud while composing their texts. Reaction times to auditory probes were also collected to reflect writers’ cognitive effort. Two sets of variables were measured: general temporal indicators (fluency, prewriting pause) and online management of writing processes (number, mean length of episodes). Finally, text quality was assessed. As expected, results confirmed that narrative and argumentative texts are composed using different strategies. Students also composed better texts when a quality-based goal had been set. The main reliable indicator of text quality was an increase of the prewriting pause and of planning processes. These findings indicate that writers tailor their writing behavior to match the type and quality of the text they are asked to produce. These results are discussed in the light of interventions and recommendations in the classroom.

Keywords: text production, text quality, writing strategies, argumentation, narrative

What determines the quality of a text composed by a student? Text quality is obviously related to the writer’s level of verbal skill (Kellogg, 1994; McCutchen, 1986). For example, skilled middle-school students display more fluent lexical and sentence-generation processes than do less skilled students (McCutchen, Covill, Hoyne, & Miles, 1994). However, whereas high verbal ability may be necessary for text composition, it is not sufficient if the writer has nothing to say about the topic of the writing task. In accordance, aside verbal skills, writers’ prior domain knowledge also contributes to writing achievement. It is well known in cognitive science that differences in domain knowledge profoundly affect performance within the domain of expertise (Ericsson, Charness, Feltovich, & Hoffman, 2006; Simon & Chase, 1973). In writing, students with high domain knowledge generally use more sophisticated strategies than do their less knowledgeable counterparts and produce better structured texts (Bereiter & Scardamalia, 1987). They also devote fewer cognitive resources to the task, because their knowledge is more organized and more easily accessible in long-term memory (Kellogg, 1987a, 2001; McCutchen, 2000).

It also has been suggested that the ability to exert deliberate control over the management of the writing processes during composition is central to producing good-quality texts and, accordingly, that the online management of writing processes is a fundamental component of writing skill (Levy & Ransdell, 1995; McCutchen, 1988). At least four major writing processes can be distinguished. Planning processes allow preparing the content of the text by retrieving ideas from the writer’s long-term memory or from the environment and by reorganizing these ideas if necessary. Planning processes also schedule writing by preparing action plans for composing. Translating processes grammatically encode the conceptual structure elaborated during planning by retrieving in the mental lexicon the syntactic and morphological properties of the words to be written. Orthographic encoding is further needed prior to handwriting. Transcribing (or handwriting) processes are used for writing down the text. Handwriting (or typing) movements are first programmed and then are executed. Finally, revision processes (reading and editing) allow writers to compare the segments of the text not yet handwritten or the text already written with their mental representation of the intended text. In that framework, text composition performance is thought to depend on the use of different writing strategies involving both planning processes (Chai, 2006; De La Paz & Graham, 2002; Kellogg, 1988, 1990) and revising processes (Graham, MacArthur, & Schwartz, 1995). This relationship between the writer’s performance and his or her management of the writing processes stems from the considerable demands that writing places on working memory. It has been shown that writing achievement is strongly related to working memory (WM) in both novice writers (Berninger & Swanson, 1994; McCutchen, 1996) and skilled writers (Kellogg, 1996, 1999). All the writing processes require large WM capacity and place heavy demands both on the central executive and on the verbal and visuospatial short-term components of WM (Kellogg, 1996; McCutchen, 2000; Olive, 2004; Olive, Favart, Beauvais, & Beauvais, 2009; Olive, Kellogg, & Piolat, 2008). This means that
writers often experience cognitive overload (Flower & Hayes, 1980). To avoid such an overload, they have to juggle efficiently the writing processes and their respective demands during the course of composition. As well as knowing what to write in their text and how to formulate it, students also have to know how to coordinate and regulate the resources allocated to the processes involved in writing (Kieft, Rijlaarsdam, & van den Bergh, 2008). Therefore, effectiveness in writing would appear to be based on the writer’s ability to regulate the writing processes to apply an effective writing strategy (Breetvelt, van den Bergh, & Rijlaarsdam, 1994; Levy & Ransdell, 1995; van den Bergh & Rijlaarsdam, 2001).

In the present study, we explored this notion by investigating the relationship between text quality and the functional characteristics of the writing processes. More specifically, we examined the relation between several measures of the online management of the writing processes and the quality of two types of text (narrative and argumentative). A second aim of the study was to investigate how a goal emphasizing text quality might affect the relationship between text quality and the orchestration of the writing processes. After discussing the online management of the writing processes, we examine how it is linked to text quality. We then describe the two experiments we conducted in order to analyze the functional characteristics of the writing processes (measures indicating how the writing processes are activated in the course of composition) and their relationship to text quality.

As far as the online management of writing is concerned, the first important observation to make is that the writing processes are not distributed in a linear fashion. Breaking with the traditional rhetorical view of writing, which emphasized the linearity of planning, translating and reviewing, Hayes and Flower (1980; Flower & Hayes, 1980) showed that writing is actually highly recursive, with continual shifts between planning, translating, and reviewing. In other words, one writing process may interrupt another at any time during composition. The amount of time devoted to these writing processes also changes in the course of composition. Whereas translating remains activated throughout, toward the end of composition there are fewer episodes of planning and more of revision (Olive, Kellogg, & Piolat, 2002). These episodes are also surprisingly short. For example, Levy and Ransdell (1995) found that planning episodes in their study lasted no more than 7 s.

Another fruitful approach for studying the dynamics of writing has consisted in investigating production pauses (Matsushashi, 1981). Writers generally spend more than 50% of the writing time pausing (Alves, Castro, Sousa, & Stromqvist, 2007). However, whereas children find it difficult to activate the writing processes while they are transcribing their text, more skilled writers can activate these processes concurrently during transcription (Olive & Kellogg, 2002). More specifically, translating is mainly activated concurrently with transcription by skilled writers, whereas planning and revising are mainly activated during production pauses (Alves, Castro, & Olive, 2008; Olive, Alves, & Castro, 2009).

Describing the online management of the writing processes is a first step toward understanding the cognitive strategies that underwriting achievement. It is equally important to relate these strategies to the quality of the resulting texts, because online management of the writing processes plays a decisive role in text quality. Penningroth and Rosenberg (1995), for instance, examined the impact of a low or high cognitive load on text quality and coherence and showed that with a high load, writers maintained the quality of their texts by modifying the temporal distribution of the writing processes. More specifically, although the total time devoted to each process remained the same in both the high- and low-load conditions, participants altered the amount of time spent on a given process at a given writing stage. Reviewing, for instance, appeared earlier on in the composition process when the load was high. Focusing on the recursiveness of writing, Levy and Ransdell (1995) analyzed how undergraduate writers shift between the writing processes. They showed that good and poor writers exhibited different patterns of transition. Whereas good writers shifted homogeneously between all the writing processes, weak writers mainly shifted between planning and translating. A study by Ferrari, Bouffard, and Rainville (1998) of junior college students confirmed the existence of distinct patterns of writing behavior for good and poor writers. They showed that poor writers wrote shorter texts and spent less time before beginning to write.

To sum up, given that writing processes engage working memory to a considerable extent, the way writers manage their writing processes may impact on text quality (Breetvelt et al., 1994; Levy & Ransdell, 1995), and good and poor writers may be distinguished on the basis of how and when they use the writing processes during composition. A number of different strategies are available to writers for composing a text. Writers can compose their text more or less recursively, i.e., focusing on one process at a time or frequently switching between several different ones. They can also decide when to activate a particular process, and they can compose by paying more or less attention to the writing processes and allocating more or less time to them. The choice of a writing strategy in a particular writing context is thus decisive for writing performance. Examining the functional characteristics of the writing processes and their relationship to text quality is crucial to a better understanding of writing.

General Goal and Method of the Experiments

The main goal of the two experiments reported in this article was to examine that relationship between text quality and the functional characteristics of the writing processes. Skilled writers composed two different texts: a narrative and an argumentative one. According to Bereiter and Scardamalia (1987), different strategies are used to compose these types of text. With narrative texts, because writers rely on a discourse schema that guides retrieval in long-term memory of the text content, they can use a knowledge-telling strategy, which consists of directly formulating ideas retrieved in long-term memory without organizing these ideas into a plan. In contrast, there is no such schema for argumentative texts. Therefore, writers have to organize content of their text to produce relevant text that matches the rhetorical constraint of convincing an addressee. Composing this type of text thus entails a complex and sophisticated knowledge-transforming strategy that requires elaborated organization of the content of the text. The presence of such strong rhetorical constraint means that the management of argumentative organization is complex and effortful (Golder, 1996), as indicated by pauses longer than in narratives (Matsushashi, 1981). Asking participants to compose two types of text thus enabled us to specify further the nature of the relationship between text quality and the functional characteristics of the writing pro-
cesses, by analyzing whether the same functional characteristics account for different strategies and for text quality.

In both experiments, two variables relating to the general temporal parameters of the compositions were measured, namely the length of the prewriting pause and writing fluency. Prewriting pauses (the time that elapses between the end of the instructions and the setting of pen to paper) are mainly devoted to the initial planning of text content. More precisely, writers were not allowed to prepare a first draft or outline before embarking on the actual writing. However they did have the possibility for mentally planning their texts. That kind of mental preplanning has been shown to be beneficial for the resulting text quality (Kellogg, 1988, Experiment 2). In accordance, students who spend a long time planning their text before beginning to write it down should produce a better structured text containing more ideas. Fluency, which is generally estimated by calculating the number of words produced per minute of composition, is an index of the overall efficiency of all the writing processes (McCutchlen, 1988). Fluency may therefore also be positively related to text quality.

Another set of measures concerned the way in which the writing processes were implemented and was intended to show how writers managed the writing task. For that purpose, writers were asked to think aloud while composing their text, and the verbal protocols were then analyzed to identify the functional characteristics of the writing processes. It may be argued that asking students to think aloud while composing their texts disrupts the way in which the writing processes are organized. Several studies, however, have shown that asking writers to think aloud affects neither writing strategies nor text quality and only reduces fluency (Kellogg, 1987b; Olive et al., 2002; Piolat & Olive, 2000; Ransdell, 1995). In addition, as all writers thought aloud, its possible effects were neutralized. For the two present experiments, students’ verbal protocols were analyzed to calculate the number and length of episodes of each writing process.

To complement these measures, and to assess the cognitive effort required for each writing process, writers performed a secondary reaction-time (RT) task. They were asked to respond as quickly as possible to randomly distributed auditory probes. Length of RTs was assumed to reflect cognitive effort, or the amount of working memory capacity required to implement a particular cognitive operation. Each RT was associated with a particular writing process by matching the occurrence of an auditory probe to a segment of the relevant think-aloud protocol. It was thus possible to assess the cognitive effort of each writing process. Because cognitive effort is also an index of the intensity of cognitive operations, we also expected it to have a positive relationship to text quality.

Thus, the participants had to perform three tasks concurrently: writing, reacting to auditory probes, and verbalizing their thoughts. This method, which was initially used by Kellogg (1987a) and that was later called the triple task (Olive et al., 2002), raises several methodological questions concerning particularly its reactivity with the primary composition task. Several studies have been conducted to assess the validity of this technique by examining (a) whether the RT task and the verbalization one affect the composition task, (b) how the interrupting rate modulates the RTs, and (c) whether different verbalization trainings influence how writers verbalize their thoughts (Kellogg, 1987b; Piolat, Kellogg, & Farioli, 2001; Piolat, Olive, Roussey, Thunin, & Ziegler, 1999; Piolat, Roussey, & Farioli, 1996; Ransdell, 1995). Globally, these studies indicate that the triple task does not disrupt the writing process. Neither the functional characteristics of the writing processes nor quality of the texts produced are influenced. It only affects writing fluency by reducing the writing rate of participants (for a detailed review, see Olive et al., 2002).

One important issue for the purposes of the present study is the assessment of text quality. A distinction can be made between reader-based and text-based assessments (Schriver, 1989; Spencer & Fitzgerald, 1993). Text-based assessments mainly use objective measurements of text features. For example, the number of spelling errors and the number of words per T-unit (a dominant clause and its dependent clauses or phrases) are objective, text-based measures. One advantage of this type of measure is that it does not depend on the person who is scoring, so it is highly replicable. It does not, however, tell us anything about the reader’s feelings about the text. Reader-based measures attempt to capture the way in which readers perceive texts. These assessments are subjective, in the sense that each score given to a text expresses the reader’s feeling and, thus, may vary from one reader to another. Some criteria can be followed to ensure maximum reliability of the assessment, such as asking several judges to score the texts and allowing them to discuss common criteria (Freedman & Calfee, 1983). We opted for such a measurement because it is also particularly relevant from an educational perspective, being relatively similar to the way in which teachers assess their students’ texts. More specifically, the features of the texts we analyzed were largely inspired by the Six-Subgroup Quality Scale (Ransdell & Levy, 1996), which analyzes 13 dimensions of a text before calculating an overall score. In accordance, both the content and stylistic quality of each text were scored by two judges. A single overall quality score was also calculated from these scores.

Finally, the issue of the writing medium needs to be discussed before presenting the two experiments. Writing with a computer is more and more frequent today. Students often take notes with computers during their courses; they also often do homework writing with a computer, and they write with computers for interpersonal communication (e.g., e-mails, social networking, chats). Several studies have shown that low skill in handwriting or in typing may affect the higher level operations involved in writing (e.g., Alves et al., 2007; Olive & Kellogg, 2002). For example, it has been shown that composing a text with a computer can affect how the writing processes are implemented (Kellogg & Mueller, 1993). Asking undergraduate students to use a computer requires controlling for difference in typing skill, which is not the case with handwriting. Furthermore, the use of computers for writing differs according to country. For instance, in France, although students generally possess computers and use them in their private life, the majority of the French undergraduate students continue to take notes or to compose texts by hand rather than with computers. Consequently, because students’ typing skill may affect their planning, translating, and reviewing processes, we asked the participants of our experiments to compose their text by hand, a highly automatized mode of transcription in undergraduate students. Moreover, the use of a pen-and-pencil task is educationally relevant, as students compose texts by hand for almost all the academic examinations.
Experiment 1

This experiment examined whether a relationship between the online management of the writing processes and text quality could be observed. Students composed both a narrative and an argumentative text. This allowed us to examine whether functional characteristics of writing and of the writing processes were differently related to quality of the narrative and argumentative texts.

Method

Participants. Twenty-four psychology students (M age = 24 years) took part in the experiment. All participants were informed of the nature of the study and agreed to participate on a voluntary basis.

Tasks. To examine the relationships between text quality and the functional characteristics of the writing processes, students were asked to compose two texts. At the same time, they had to think aloud and perform an RT task to auditory tones. Analysis of the students’ thinking-aloud protocols allowed measurement of several features of how students use the writing processes. The RT task provided secondary RTs that were considered indicative of students’ cognitive effort related to the use of the writing processes.

Writing task. Students composed two texts: one argumentative and one narrative. The order of type of text was counterbalanced between participants. For the argumentative text, participants were asked to defend their opinion about a recent French law banning smoking in public places such as offices and public buildings. For the narrative text, a set of six colored pictures was used to elicit a written narrative. More specifically, the sequence of pictures showed a boy going for a walk and meeting a balloon seller. He decides to buy a red balloon. He continues his walk when a sudden blast of wind snatches the balloon out of his hand. The boy starts to cry. Participants were instructed to compose the narrative on the basis of this set of pictures. They were asked to avoid describing the pictures but, rather, to use these pictures as a material to guide their imagination in creating a story. For both types of text, participants were instructed to compose a well-developed and well-organized text, ensuring the quality of both style and content. Moreover, writers had the opportunity to edit their texts directly on the writing sheet. They were allowed to cross out and rewrite their text when they thought it was needed. Finally, no limit was imposed on length of the texts, but participants were instructed to compose their text during at least 20 min and no longer than 30 min. When they stopped around 20 min, they were informed that they could continue writing until the 30 min had passed. If they wanted to stop, the experimenter stopped the composition. In any case, the composition time did not exceed 30 min.

The 48 texts composed by the participants were first transcribed and then rated for style and content (see the Appendix) by two independent judges on a 5-point scale (1 = low quality to 5 = high quality). Content was assessed on two subscales measuring originality of ideas and content organization. Style was also assessed on two subscales: One of these concerned sentence structure, whereas the other concerned quality of spelling and grammar. An overall quality score was then calculated by averaging the four scores. Interrater agreement was evaluated using the Pearson’s correlation coefficient at an alpha level of .05. For argumentative texts, agreement was .68 for content and .79 for style. For the narrative texts, agreement was .88 for content and .79 for style.

Thinking aloud. Participants were instructed to say everything that came into their heads while writing, without justifying or introspecting, and to try not to stop thinking aloud. The entire writing session was filmed with a camera focused on the sheet of paper. Thus, it was possible to follow participants’ writing behavior in real time. Participants’ thinking aloud was recorded simultaneously on the videotape using a microphone connected to the camera.

Once the verbal reports had been transcribed, they were divided into segments, each segment containing a single writing process. In line with Swarts, Flower, and Hayes (1984), four writing processes were identified: planning (idea generation, organizing, and goal setting), translating (creation of formal written text and tentative version of text tried out orally), reading the text produced so far, and reviewing (evaluation and text changes). A fifth category, “other,” was added for verbalizations that were unrelated to the writing task, but it was not included in the analyses. A think-aloud segment was defined by the onset and offset of a thought related to a writing process and represented an episode of this process. This allowed us to calculate the number and mean length of episodes for each of the four writing processes we examined, as well as the total time spent by the writer on the different processes. Table 1 presents the four writing-process categories that were used to code the think-aloud protocols and examples of thoughts related to these processes.

To gauge the reliability of the coding of the 48 verbal protocols, a second judge categorized 4 min of five protocols. For all 193 episodes that were judged twice, a contingency coefficient was calculated. Cohen’s kappa was .83, thereby confirming the reliability of the coding scheme. Most of the disagreements that occurred resulted from differences in defining the onset or offset of writing-process episodes.

Secondary RT task. While participants wrote and thought aloud, a computer program (ScriptKell; Piolat et al., 1999) was used to randomly distribute auditory probes and record RTs. Participants were instructed to press a button as quickly as possible with their nondominant hand each time they heard a beep. The RT task was first performed alone (i.e., in a single-task situation) and then concurrently with composition. Auditory probes were played once every 10 s on average (ranging from 5 s to 15 s) in the single-task situation and once every 30 s on average (ranging from 15 s to

<table>
<thead>
<tr>
<th>Writing processes</th>
<th>Samples of think-aloud segments</th>
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</thead>
<tbody>
<tr>
<td>Planning</td>
<td>“What else can I write?”</td>
</tr>
<tr>
<td>Generating</td>
<td>“I write this idea here, after that one.”</td>
</tr>
<tr>
<td>Structuring</td>
<td>“I have to write more before evaluating my text.”</td>
</tr>
<tr>
<td>Goal setting</td>
<td>“This word must be agreed with this verb.”</td>
</tr>
<tr>
<td>Translating</td>
<td>“Reading the text (without handwriting).”</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
</tr>
<tr>
<td>Revising</td>
<td></td>
</tr>
<tr>
<td>Evaluating</td>
<td>“This sentence is too long and too fuzzy.”</td>
</tr>
<tr>
<td>Editing</td>
<td>“I add a word in this sentence.”</td>
</tr>
</tbody>
</table>
45 s) during the composition task. Secondary RTs were assumed to reflect the cognitive effort of the ongoing writing processes; the longer the RT, the greater the cognitive effort. Cognitive effort of writing was then indexed by subtracting the median baseline RT of each student from each RT collected while the student was composing. Then the median RT was calculated. We used the median because RTs are positively skewed, and using such a statistic instead of the mean gives less weight to outliers.

**Procedure.** Participants were tested individually in two sessions that were approximately 1 week apart, both conducted by the same experimenter. The first 1-hr session began with the recording of the baseline RT. Participants were first instructed to react as quickly as possible to 20 auditory probes by pressing a button with their nondominant hand. Only the last 16 trials were used to calculate the median baseline RT, with the first four RTs regarded as warm-up responses. Participants then underwent a two-stage thinking-aloud practice session. First, they listened to a 4-min tape recording of a student thinking aloud while writing a descriptive text. All writing processes could be displayed in that thinking-aloud sample. The second step consisted in writing a procedural text for 3 min (“Explain how you cook your favorite dish”) while thinking aloud. After this training session, participants composed their first text (narrative or argumentative) for 20 to 30 min while thinking aloud and performing the secondary RT task. The think-aloud instructions were repeated just before the composition session began. These were followed by instructions about the text they had to write. Finally, the participants were asked to detect beeps as quickly as possible while writing and thinking aloud. When they were ready, the experimenter gave them the writing topic and started recording the participants’ thinking aloud.

The second session took place approximately 1 week later and lasted 30 min. Participants directly composed the second text, without any think-aloud practice session. Instructions concerning the composition, thinking-aloud, and RT tasks were repeated before participants began composing the type of text they had not composed in the first session.

**Results**

The results for each type of text are presented separately, with the narrative texts first, and then the argumentative texts. For each type of text, two sets of analyses are reported. First, possible differences in the functional characteristics of the writing processes are examined. Second, correlations between text quality, temporal features of the composition, and measures of the writing processes are calculated to test whether text quality is related to management of the composition.

**Narrative texts: Online management of the writing processes.** The means and standard deviations for all measures of online management of the writing processes are presented in Table 2. For all variables, an analysis of variance (ANOVA) with the writing processes (planning, translating, reading, revising) as repeated measures was calculated. All post hoc comparisons were performed using Scheffé’s test at an alpha level of .05. Even though participants were instructed to compose their text during at least 20 min and no longer than 30 min, no significant difference in composition time was observed between the narrative and argumentative texts (respectively, 24.5 s and 24.1 s). However, to control for possible individual differences in composition times, we calculated the percentage of time spent for each process and the number of episodes of each process was divided by the total writing time. The percentage of time spent on the different writing processes significantly differed, \(F(3, 69) = 143.79, \ p < .0001\), partial \(\eta^2 = .86\). Post hoc analyses indicated that the time spent on translating was significantly longer than the time spent on planning and reading. These latter two processes were activated for longer than revising. The number of episodes also reliably differed between writing processes, \(F(3, 69) = 32.74, \ p < .0001\), partial \(\eta^2 = .59\). As indicated by the post hoc tests, there were more episodes of translating and reading than of planning, and even fewer episodes of revising. The ANOVA for the mean length of episodes also revealed, as expected, a main effect of writing processes, \(F(3, 69) = 87.04, \ p < .0001\), partial \(\eta^2 = .79\). Post hoc tests indicated that translating episodes were significantly longer than planning episodes, followed by reading and revising episodes.

**Narrative texts: Correlations between online management of composition and text quality.** A preliminary analysis of text quality indicated that quality scores differed according the analytical scale concerned, \(r(23) = 2.43, \ p < .05\), Cohen’s \(d = 0.42\). The style score \((M = 3.3, SD = 1)\) was significantly higher than the content score \((M = 2.9, SD = 1.1)\). An overall score of text quality (the mean of the style and contents scores) was then calculated and used for the correlation analysis. The overall quality of the narrative texts was positively correlated with the number of episodes, especially planning and translating episodes, but was negatively correlated with mean length of the episodes, especially translating episodes (see Table 3). This relationship between narrative quality and the frequency of writing-process activation suggests that the shortest the episodes of planning and translating, the better the

<table>
<thead>
<tr>
<th>Type of text</th>
<th>Online variable</th>
<th>Narrative</th>
<th>Argumentative</th>
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<tbody>
<tr>
<td>Prewriting pause (s)</td>
<td>31 (24)</td>
<td>65 (38)</td>
<td></td>
</tr>
<tr>
<td>Fluency (words/min)</td>
<td>13.7 (3.5)</td>
<td>12.1 (3.3)</td>
<td></td>
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<tr>
<td>Percentage of time Planning</td>
<td>19 (7)</td>
<td>21 (9)</td>
<td></td>
</tr>
<tr>
<td>Translating</td>
<td>57 (11)</td>
<td>53 (10)</td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>16 (8)</td>
<td>17 (6)</td>
<td></td>
</tr>
<tr>
<td>Revising</td>
<td>6 (3)</td>
<td>7 (3)</td>
<td></td>
</tr>
<tr>
<td>No. of episodes per min Planning</td>
<td>1.5 (0.5)</td>
<td>1.1 (0.4)</td>
<td></td>
</tr>
<tr>
<td>Translating</td>
<td>2.3 (0.5)</td>
<td>2 (0.5)</td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>1.9 (0.8)</td>
<td>1.9 (0.8)</td>
<td></td>
</tr>
<tr>
<td>Revising</td>
<td>1.1 (0.4)</td>
<td>1.2 (0.5)</td>
<td></td>
</tr>
<tr>
<td>M length of episodes (s) Planning</td>
<td>1.7 (0.7)</td>
<td>1.5 (0.7)</td>
<td></td>
</tr>
<tr>
<td>Translating</td>
<td>8 (3)</td>
<td>12 (5)</td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>16 (5)</td>
<td>17 (5)</td>
<td></td>
</tr>
<tr>
<td>Revising</td>
<td>5 (2)</td>
<td>6 (2)</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4 (2)</td>
<td>4 (1)</td>
<td></td>
</tr>
<tr>
<td>Overall median response times (ms)</td>
<td>196 (92)</td>
<td>249 (106)</td>
<td></td>
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</tbody>
</table>

Note. Standard deviations appear in parentheses.
quality of the narrative texts. Unexpectedly, no correlation was found between text quality and length of the prewriting pause, and the amount of time spent on planning. It was negatively correlated with fluency and the time spent on translating. No relation with cognitive effort was found (see Table 2 for means and standard deviations and Table 3 for correlation coefficients). This pattern of correlations suggests that, in contrast to narrative texts, students composing an argumentative text benefitted more from spending time on the planning processes, in other terms in conceptual processing, than creating formal text using the translating processes.

**Discussion**

Overall, the activation of the writing processes observed in this first experiment matched the traditional temporal pattern observed in previous studies using directed verbalizations (Kellogg, 1987a, 1990) or think-aloud protocols (Levy & Ransdell, 1995; Penningroth & Rosenberg, 1995). The time spent on each process replicated previous findings for both types of text: Translating occurred more frequently and lasted longer than planning and revising. Reading, usually included in revising, was considered separately in the present experiment and was activated just as frequently as translating. However, even though the present findings replicate previous studies, they also provide complementary data about the temporal organization of writing processes. Results show that the average length of episodes differed for each writing process, with the translating episodes being the longest.

Given the differences in the prompts used to stimulate text production between the two text types (six illustrations that elicited the narrative texts, and only a sentence printed at the top of the composition sheet to introduce the topic of the argumentative texts production), we did not conduct a direct statistical comparison between the two text types. However, the entire set of analyses used for each text type allowed us to distinguish two different ways for managing production of the argumentative and narrative texts. This is particularly attested by the differences in the way students distributed the writing processes across the composition. These differences were expected because the argumentative and narrative texts place different demands on planning processes. Narrative texts were composed by activating the writing processes in short but frequent episodes, compared with argumentative texts. This can be interpreted in terms of the recursive orchestration of the writing processes. Thanks to the availability of the narrative schema in long-term memory, a narrative can be produced by retrieving ideas associatively and writing them down immediately, without reworking the retrieved content. This recursive functioning is in line with the knowledge-telling strategy (Bereiter & Scardamalia, 1987), in which novices or experts with a schema available in long-term memory compose a coherent text without reorganizing the retrieved content. The online management of argumentative composition appeared to be quite different. Writers took a long prewriting pause, composed with slow fluency and long writing process episodes (especially for planning) and expended considerable cognitive effort compared to narrative texts. This greater difficulty in composing and planning argumentative texts is in line with the findings of previous studies that have examined different types of texts using a variety of methodologies (Kellogg, 2001; Matsuhashi, 1981).
Regarding the possible relationship between the online management of writing and the quality of the resulting texts, the results clearly indicate that the quality of narrative and argumentative texts depends on two different types of online management. Narrative quality was positively correlated with the number of writing process episodes and, more specifically, with the number of planning and translating episodes. Therefore, writers produced good narrative texts by activating the writing processes in a highly recursive way, with frequent and continual shifts between them. This interpretation is confirmed by the fact that the mean length of the writing process episodes, especially translating episodes, was negatively correlated with text quality, indicating that short episodes yielded better texts than long ones. This suggests that the knowledge-telling strategy is more efficient when it comes to composing a good narrative text. Therefore, frequent shifts between processes constitute a general feature of effective and low-demand writing. This type of online management reflects a composition process that is guided by a schema stored in long-term memory and that does not require long episodes of reflection. Conversely, with the argumentative texts, the findings show that text quality depends on a different type of online management. More specifically, text quality was positively associated with length of the prewriting pause and the time spent on planning. These findings demonstrate the importance of planning, which plays a central role in the composition of a high-quality argumentation. Argumentative text is a complex kind of discourse that not only involves retrieving ideas, arguments, and counterarguments to support one’s opinion but also requires taking the addressee’s opinion into account. These communicative goals necessitate elaborate planning and the appropriate and deliberate organizing of ideas. Overall, those writers who composed the best argumentative texts benefited from intense planning and therefore slowed their production down, as indicated by the negative correlation between fluency and text quality.

**Experiment 2: Effect of a Quality-Based Goal**

Experiment 1 showed that narrative and argumentative texts are composed using two different strategies and that text quality depends on the variables that define these strategies. Experiment 2 tested whether a quality-based goal affects these strategies and explored their relationship with text quality. One method of enhancing writing performance is to define a set of goals, prior the writing task. “Goal setting is an important part of good writing” (Page-Voth & Graham, 1999, p. 230), and a clear requirement about the text to be composed seems to be a key factor in self-regulated behavior designed to achieve the writing goal and text quality (Kaplan, Lichtenger, & Gorodetsky, 2009). Goal-setting procedures invite writers to direct their attention to elements that will help them reach those goals, such as the number of ideas to be included in the final text (Ferretti, Lewis, & Andrews-Weckerly, 2009; Ferretti, MacArthur, & Dowdy, 2000; Graham et al., 1995) or the length of the finished written product (Hopman & Glynn, 1989).

In line with these studies of the effects of goal-setting on writing performance, the present experiment investigated the effects of giving students a quality-based goal emphasizing the quality of both style and content (i.e., the two components of the Text Quality Assessment scale). This condition was compared with a condition in which a standard goal was given, namely one without any explicit expectations about quality. We expected to observe a positive impact of the quality-based goal not only on text quality but also on online management of composition. Moreover, we expect this effect to differ according to the type of text produced. In accordance, and in line with findings of Experiment 1 that demonstrated that students use two different strategies for composing a narrative text or an argumentative one, we predicted that a quality-based goal would foster the use of these strategies. More specifically, students who composed a narrative text with a quality-based goal would be more fluent and would use the writing processes by activating them in shorter and more frequent episodes. Students who composed an argumentative text with a quality-based goal would rather spend even more time before beginning of writing and engage the planning processes more extensively.

**Method**

**Participants.** Fifty-eight psychology students took part in the study (M age = 22 years). After all the participants had been informed of the nature of the study and had agreed to participate, they were randomly assigned to one of the two experimental conditions (standard goal vs. quality-based goal).

**Tasks.** Experiment 2 replicated the method used in Experiment 1, the one exception being the instructions that were provided to the participants. In the standard goal condition, participants received instructions that did not place any emphasis on the quality of the texts they had to compose (same instructions as in Experiment 1). In the quality-based goal condition, participants were instructed to compose texts of a very high quality in terms of both style and content. Concerning content, participants were asked to include a large number of ideas in their texts and to organize them in the most appropriate way. Concerning style, they were asked to use a rich and precise vocabulary and to write well-constructed sentences. All other instructions relating to composition were identical to those used in Experiment 1. One other difference was introduced. In Experiment 1, the pictures that elicited the narrative were displayed on a separate sheet of paper, whereas the topic of the argumentation was printed at the top of the composition sheet. As this may have led participants to read the topics differently, both topics were printed on the composition sheet in Experiment 2, and consequently, the topics of the narrative texts were changed. The topic eliciting the written narrative was that of a burglar who breaks into the writer’s house at night. Participants were instructed to compose their texts on this basis. The topic of the argumentative text was also changed: Participants were asked to defend their opinion about selective university admissions. Therefore, these changes in the material allowed a direct comparison between the online management of the writing processes in these two types of text.

**Analyses and data coding.** One hundred sixteen compositions and verbal reports were collected. The first author categorized the set of 116 verbal protocols. Reliability of coding was evaluated by asking a second judge to assess a subset of 4 min of four transcripts. For the 4 min of verbal protocols (i.e., 97 episodes), agreement for categorization estimated with Cohen’s Kappa was .79, revealing a reliable degree of agreement between the two judges. The 116 texts were also transcribed and indepen-
dently rated by the same two judges on the same analytical scales (the scores given by the two raters were averaged). For argumentative texts produced in the quality-based goal condition, interrater agreement was .69 for style and .70 for content. For the argumentative texts produced in the standard goal condition, interrater agreement was .76 for style and .61 for content. For narrative texts produced in the quality-based goal condition, interrater agreement was .63 for content and .63 for style. Finally, for narrative texts produced in the standard goal condition, interrater agreement was .81 for content and .88 for style.

**Results and Discussion**

In all analyses, Type of text, writing processes, and quality scores were entered as withinsub-participants factors, and goal was entered as a between-participants factor. Post hoc comparisons were performed using Scheffe’s test at an alpha level of .05.

**Text analysis.** Table 4 presents the means and standard deviations of quality scores for each analytical scale in the two conditions, for each type of text. A Type of Text (narrative, argumentative) × Goal (quality-based, standard) multivariate analysis of variance (MANOVA) was conducted on both measures of text quality. This analysis showed a main effect of the type of text. Wilks’s lambda = .87, F(2, 55) = 3.92, p = .02, partial \( \eta^2 = .12 \), and of goal, Wilks’s lambda = .83, F(2, 55) = 5.46, p = .006, partial \( \eta^2 = .17 \), with a marginal significant interaction between type of text and goal, Wilks’s lambda = .91, F(2, 55) = 2.64, p = .08. To determine whether the instructions affected text quality in each type of text, we conducted two separate MANOVAs for the narrative and argumentative texts. With narrative texts, a main effect of goal was observed, Wilks’s lambda = .85, F(2, 55) = 4.75, p = .01, partial \( \eta^2 = .15 \). The narrative texts were judged to be of better quality in the quality-based goal condition than in the standard goal condition. With argumentative texts, goal also reliably affected text quality, Wilks’s lambda = .81, F(2, 55) = 6.59, p = .003, partial \( \eta^2 = .19 \). As for narrative texts, texts in the quality-based goal condition were judged to be of better quality than those in the standard goal condition.

Next, to analyze which measure of text quality was affected by the goal manipulation, we conducted a separate univariate ANOVA for each type of text with the goal and quality score factors. With narrative texts, a main effect of goal was observed, F(1, 56) = 6.88, p < .05, partial \( \eta^2 = .12 \). The narrative texts were judged to be of better quality in the quality-based goal condition than in the standard goal condition. A significant Goal × Quality scores interaction was observed, F(1, 56) = 4.52, p < .05, partial \( \eta^2 = .07 \). More precisely, the quality-based instructions impacted more on the style score than on the content score of the narratives, suggesting that participants focused more on formulation of their text than on content. In any case, the quality instructions increased both scores. With argumentative texts, only goal reliably affected text quality, F(1, 56) = 10.95, p < .01, partial \( \eta^2 = .17 \). Argumentative texts in the quality-based goal condition were judged to be of better quality than those in the standard goal condition. In sum, the quality-based goal increased the quality of the texts, regardless of their type. This demonstrates that the quality goal instructions improved quality of the texts that were composed by students. According to our main hypothesis, changes in how the composition was orchestrated may be expected.

**General temporal analysis.** Mixed ANOVAs were conducted with Type of Text (narrative, argumentative) × Goal (quality-based goal, standard goal). Means and standard deviations are indicated in Table 5.

**Prewriting pause.** The ANOVA showed a main effect of type of text, F(1, 56) = 23.90, p < .0001, partial \( \eta^2 = .30 \). The mean prewriting pause was shorter for the narrative texts than for the argumentative ones. Because the prewriting pause is mainly devoted to text and procedural planning, composing an argumentative text presumably requires writers to spend more time before writing elaborating or structuring content of their text. The prewriting pause also tended to be affected by the goal factor, F(1, 56) = 3.46, p = .07, partial \( \eta^2 = .06 \). It was longer with a quality-based goal than with standard instructions. More precisely, the quality-based goal improved writing performance regardless of the type of text, as indicated by the absence of significant Type of Text × Goal interaction, F(1, 56) = 2.32, p = .13. We suggest that such an increase in prewriting time is likely to be devoted to planning. To test this idea, we analyzed the processes that occurred during that prewriting time. There were less episodes of planning, F(1, 56) = 4.721, p = .034, which tended to be longer, F(1, 56) = 2.823, p = .09, with the quality goal (70% of episodes, which lasted 49.6 s) than with the standard instructions (79.3%; 39.3 s). It thus appears that it is the length and not the number of the planning episodes that are carried out during the prewriting pause that brings benefits to text quality. Taking the time to think before setting pen to paper thus appears to be beneficial, whatever type of text is being produced. It may be during this prewriting pause, specifically devoted to planning, that students set their rhetorical goals.

**Fluency.** Only the type of text significantly affected fluency, F(1, 56) = 53.66, p < .0001, partial \( \eta^2 = .49 \). Participants wrote

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<th>Table 4</th>
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<tr>
<td><strong>Means and Standard Deviations of Quality Scores in Narrative and Argumentative Texts, According to the Goal Condition in Experiment 2</strong></td>
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<tr>
<td><strong>Narrative</strong></td>
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<td><strong>Quality subscale</strong></td>
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*Note.* Standard deviations appear in parentheses.
more words per minute when they composed a narrative than when
they composed an argumentation. No effect of goal, $F(1, 56) < 1$, and
no interaction, $F(1, 56) = 1.66, p = .20$, were observed. Accordingly,
even if writers are more fluent when they compose a
narrative text than an argumentative one, the goal did not affect the
fluency at which they composed their texts.

**Online management of the writing processes.** A MANOVA
was conducted to determine the effects of type of text, writing
process, and goal on all dependent variables that assessed online
management of the writing processes. This analysis showed a main
effect of the type of text, Wilks’s lambda $= .51, F(3, 54) = 17.31, p < .0001, partial \eta^2 = .49$, and of writing processes, Wilks’s
lambda $= .02, F(9, 48) = 297.77, p < .0001, partial \eta^2 = .98$, but
no effect of goal, Wilks’s lambda $= .95, F(3, 54) < 1$. The type of
text also interacted with the writing processes, Wilks’s
lambda $= .23, F(9, 48) = 17.46, p < .00001, partial \eta^2 = .70$. No
other interaction was significant. As this analysis shows, the writing
processes were differently used according to the type of text to compose. It is important to note that the instructions about text quality did not affect online management of the writing processes.

To determine if a particular measure of online management of the writing processes was affected by the experimental factors, we then conducted a Type of Text (narrative, argumentative) × Writing Processes (planning, translating, reading, revising) × Goal (quality-based goal, standard goal) mixed ANOVA for each measure. All data are presented in Table 5.

**Percentage of time spent on each writing process.** As for Experiment 1, students were asked to compose their text during at
least 20 min but no longer than 30 min. Again, even if no difference in composition time was observed between the standard and quality goal conditions (respectively, 23.6 s and 25.1 s), we analyzed the percentage the time spent for each writing process to control for individual difference in composing time. Moreover, because we used percentages and their sum equaled 100, the mean percentages in each type of text are 50%. Thus, we do not present results of the analysis for the main effects of type of text and goal, nor the interaction between type of text and goal.

The time spent on each process differed significantly, $F(3, 168) = 348.08, p < .0001, partial \eta^2 = .86$. Writers spent most time on translating, followed by planning, then reading, and finally revising. This finding is convergent with previous studies that obtained the same difference in the time allocated to the writing processes (Olive et al., 2002; Piolat et al., 1999). The Writing Processes × Goal interaction was not significant, $F(3, 168) < 1$. The amount of time the writers allocated to the different writing processes therefore was not affected by the instructions about quality of the text. The interaction between writing processes and type of text was significant, $F(3, 168) = 3.73, p < .05$, partial \eta^2 = .06. However, the post hoc test failed to reveal any effect of the type of texts in terms of time spent planning, translating, reading or revising. Actually, this significant interaction resulted only from difference between the writing processes in each type of text. Moreover, the global pattern of time devoted to the writing processes remained the same in the two types of text. No other interaction was found to be significant. The goal did not affect at all the time spent in each writing process.

**Number of writing process episodes per minute of composition.** To control again for individual differences in the number of episodes of the writing processes, we also divided the number of episodes of each writing process by the total writing time.

A significant main effect of type of text on the number of episodes was observed, $F(1, 56) = 42.91, p < .0001, partial \eta^2 =
.43. There were more writing process episodes during narrative composition than during argumentative composition. A main effect of writing processes was also observed, \( F(3, 168) = 75.69, p < .0001, \) partial \( \eta^2 = .57 \). Post hoc tests revealed that translating episodes were more numerous than planning and reading episodes. Revising was the least activated process. No significant difference was observed between the two goal conditions, \( F(1, 56) = 2.40, p = .13 \). As the significant Type of Text \( \times \) Writing Processes interaction showed, \( F(3, 168) = 41.41, p < .0001, \) partial \( \eta^2 = .43 \), only planning and translating episodes were more numerous in the narrative texts than in the argumentative ones. No other effect was significant (\( Fs < 1 \)). As for the time spent in each writing process, their number of episodes was not affected by the quality-based goal. Differences were observed only between the two types of text and between each writing process.

**Mean length of episodes.** First, mean length of the episodes of each writing process significantly differed, \( F(3, 168) = 138.33, p < .0001, \) partial \( \eta^2 = .71 \). Translating episodes were longer than planning ones, followed by reading and revising episodes, which were of equal mean length. This also replicates previous studies on online management of the writing processes. Second, the type of text factor significantly affected the mean length of a writing process episode, \( F(1, 56) = 42.13, p < .0001, \) partial \( \eta^2 = .43 \), which also significantly interacted with writing processes, \( F(3, 168) = 14.88, p < .0001, \) partial \( \eta^2 = .21 \). More specifically, episodes were shorter in the narrative texts than in the argumentative ones, but this reduction only concerned planning and translating: The episodes of these two processes indeed lasted longer when composing argumentative texts than when composing narrative texts. Goal did not affect the mean length of an episode, \( F(1, 56) = 2.57, p = .11 \). No other interaction was significant (\( Fs < 1 \)). As in the previous analysis of online management of the writing processes, the quality-based goal did not influence length of the episodes of the writing processes.

**Cognitive effort.** A Type of Text \( \times \) Goal mixed ANOVA was calculated on the median RTs. Contrary to Experiment 1, this analysis showed that writing an argumentative text did not entail a higher overall RT than writing a narrative one, \( F(1, 56) = 2.28, p = .14 \). There was no other significant effect. Again, the quality-based goal did not affect writers’ cognitive effort devoted to writing.

**Correlations with text quality.** We also examined how the different measures that were analyzed correlated to text quality. Quality of the argumentative and narrative texts produced with the high-quality goal was positively correlated with length of the prewriting pause (.39 and .42, respectively), and quality of the narratives was negatively correlated with fluency (−.38). It thus seems that both the prewriting pause and fluency can be considered as indicating efficiency of the writing processes and, subsequently, of text quality. To take into account size of the sample and variability in RTs, we pooled the median RTs across the two experiments and examined how they correlated with text quality. The correlations replicated those of Experiment 1: Cognitive effort was not reliably correlated with quality of either the narrative (\( r = .05 \)) or argumentative texts (\( r = .02 \)). Thus, global attention given to the task does not seem to be related to quality of the texts. No other variable was correlated with text quality.

**General Discussion and Conclusion**

The two experiments reported in this article examined whether text quality is related to the online management of the writing processes. Experiment 1 manipulated the type of text students had to compose by asking them to compose narrative and argumentative texts. Two different composing strategies were observed, and the quality of the narrative and argumentative texts was correlated with these respective strategies. Experiment 2 directly manipulated text quality. Students were provided with either standard instructions or instructions stressing the need for quality (i.e., asking students to compose a text of a very high quality). Students who received this instruction rather than the standard instructions composed texts that were assessed as being of a better quality. However, in this condition, the major change in the online management of the writing processes was an increase in the length of the prewriting pause in the quality-based goal condition. More precisely, planning episodes that occurred during the prewriting pauses were affected by a quality goal. This change in planning during the prewriting pause sufficed to improve text quality.

The present study investigated skilled writers who use self-regulation procedures to guide the writing process. Thus the present findings cannot be generalized to novice writers. However, instructional designs intended to improve self-regulation when composing in children with or without learning difficulties have also been found to be effective, increasing the quality of the texts they produce (Graham & Perin, 2007; Zimmerman & Risemberg, 1997). Evidence of the successful application of a self-regulation strategy can be found by asking students to compose different types of texts. Do they change the way they compose? If so, how do they orchestrate the writing processes? And does this change allow them to maintain the quality of their texts? As well as attempting to provide answers to these questions, Experiment 1 of the present study also sought to demonstrate that skilled writing relies, at least partially, on the skilled orchestration of the writing processes.

As indicated by the findings of Experiment 1, students used different writing strategies, according to whether they were composing a narrative or an argumentative text. It is important to note that the instructions they received did not include any information about how to compose their text. Despite the absence of specific instructions regarding the writing strategy, students used the writing processes in two very different strategies that matched the respective demands of narrative and argumentative texts. For instance, because the narrative schema stored in long-term memory constitutes an important device that helps writers to organize content of their text, they proceed by frequently alternating between idea-retrieval and translating processes. On the contrary, argumentative texts require the writers to organize content of the text using a complex and effortful knowledge-transforming strategy (Bereiter & Scardamalia, 1987). This strategy requires long episodes of writing processes, particularly planning for organizing the content of the text according to the rhetorical goals of argumentation.

There was a positive correlation between the quality of the students’ texts and the strategies they adopted: The more closely the writers followed the appropriate strategy, the better texts they produced. An initial response can therefore be given to the question we raised in the introduction to this article: Writing quality
depends, at least partially, on the writer’s skill in managing the writing processes.

Do these changes in writing strategy mean that students explicitly decided to compose with short episodes of the writing processes when they were faced with a narrative composition and with long episodes of the writing processes when they had to compose an argumentative text? Or did students implicitly activate the correct strategy when they learned which type of text they had to compose? The findings of the two experiments reported in this article do not allow us to decide one way or the other. Future studies of writing acquisition and skilled writing will have to answer questions such as these about the explicit or implicit nature of writing strategies. In terms of education, beginning writers should receive explicit instructions about which strategies to use for different textual genres, such as the self-regulated strategy (Graham & Harris, 1996). We would expect the use of a particular strategy to be more implicit in skilled writers, with the writing situation activating the appropriate strategy. This does not mean, however, that the strategies are totally implicit. Some features of these strategies have to remain explicit, because each writing situation is unique, and writers, even skilled ones, have to transform their knowledge through planning and formulating to meet the task’s rhetorical goals. This may be particularly true of one aspect of self-regulation: the setting of writing goals, which was the focus of Experiment 2.

Experiment 2 explicitly encouraged students to compose a high-quality text by clearly formulating the goal of the task before composition began (Page-Voth & Graham, 1999). Contrary to our expectations, no change was observed in the orchestration of the writing processes, suggesting that students used the same strategies to compose their texts, regardless of what level of quality they were seeking to achieve. One could argue that the method we used to track writers’ online management of the writing processes was not sufficiently sensitive. It is true that thinking aloud does not allow all writing processes to be tracked, as it only targets deliberate, effortful, and conscious writing processes. However, this method has been yielding fruitful findings in writing research for the last 20 years, (Hayes & Flower, 1980; Janssen, van Waes, & van den Bergh, 1996; Pialot et al., 1999). The way in which the transcripts are categorized is also important, particularly with regard to the level of categorization, (e.g., the number of processes or subprocesses). In Experiment 1 of the present study, the think-aloud transcripts actually revealed different writing strategies. In accordance, the absence of a change in strategy cannot be attributed to the method we used. It is therefore more rational to conclude that raising the requirement for text quality does not affect the online management of the writing processes.

In fact, the emphasis on quality only affected the prewriting pause. Students waited longer before setting pen to paper. Although this change may appear minimal in the context of the present study, in which various temporal and functional features of the writing task and writing processes were measured, it is still a noteworthy finding, insofar as it sufficed to improve the quality of the resulting text, even when there was no change in the activation of the writing processes. However, it is too simplistic to argue that quality can be increased simply by increasing the time spent before writing down the text. As the findings of Experiment 2 indicate, the prewriting pause is mainly devoted to planning, with less numerous but longer planning episodes. During the prewriting pause, writers have to set themselves their writing goals and subgoals and start retrieving ideas and knowledge in long-term memory (Chai, 2006). They can even begin to structure that knowledge and assess their goals or the suitability of their ideas. In other words, producing good-quality texts may depend on the ability to take the time before writing to plan the text, analyzing the demands of the writing tasks to set goals that will guide the composition process (MacArthur, Harris, & Graham, 1994). In skilled writers, this writing behavior arises from the interaction between their metaknowledge about the composition process and the procedure they use to attain the writing goals (Berninger, Fuller, & Whitaker, 1996). When demands about text quality are clearly formulated, writers readily spend time on a prewriting strategy, maybe as they were taught to do (French national curriculum for secondary schools, 2008). During that long prewriting pause, the students in Experiment 2 presumably set goals that matched task demands and adopted the same strategy that they ordinarily used, but with these different goals. Finally, it should be noted that the beneficial effect of spacing out the conceptual component of the writing task on text quality confirms previous findings (Carey, Flower, Hayes, Schriver, & Haas, 1989; Chai, 2006; Ferrari, Bouffard, & Rainville, 1998).

In sum, both experiments demonstrated that students change and adapt their writing strategy according to the constraints of the writing task. When faced with different types of texts, they can completely change their writing strategy, as when students activated the writing processes in short episodes when they had to compose a narrative but in long episodes when they composed an argument. By contrast, when they were required to compose a good-quality text, they used the same strategies as before but spent more time thinking about their compositions before setting pen to paper. This minimal change resulted in increased quality.

Educationally speaking, the present study addresses issues related to writing acquisition and to skilled writing. The findings from the two experiments suggest that topic knowledge and language skills cannot fully account for skilled writing. As we have seen, skilled writers, like the university students who took part in the reported experiments, are adept at managing the writing processes, as they are able to shift between strategies according to task demands. It has been shown that instructions designed to improve self-regulation strategies can benefit students. However, Kellogg and Raulerson (2007) suggested that knowledge about writing requirements is necessary but not sufficient. According to these authors, deliberate practice is essential if writers are to achieve skilled writing (see also Zimmerman, 2006). Practice broadens the ability of writers to monitor the writing processes by giving them the opportunity to apply their knowledge. The present study therefore underscores the importance of teaching students about the procedural differences between different types of text. They need to learn how to set goals by analyzing the writing situation before they set pen to paper and to practice composing different types of text with different goals.

References


(Appendix follows)
Appendix

Quality Scale

Criterion 1: Style

● Spelling/Grammar

5 = No misspelled words
4 = One misspelled word
2 = More than two misspelled words
1 = More than two misspelled words with some of them being commonly used

● Sentence Structure and Conciseness

5 = Almost no run-on sentences or wasted words. Clear text and to the point.
4 = Almost no run-on sentences and few wasted words
2 = Redundant and immature. Not clear and concise.
1 = Many wasted words and many run-on sentences. Immature.

Criterion 2: Content

● Structuring of Content

5 = Structured content (use of paragraphs). Use of transitions between ideas.
4 = Structured content (use of paragraphs). Few transitions between ideas.
2 = Insufficient structuring of content. No transition between ideas.
1 = No structuring of content (no/arbitrary paragraphing). No transition between ideas.

● Ideas/Creativity

5 = Unique ideas and very mature, creative. Extensive vocabulary.
4 = Unique ideas or very mature, creative. Extensive vocabulary.
2 = Few unique ideas. Simple vocabulary.
1 = Few unique ideas. Limited vocabulary.