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WHOLE-CLASS AND PEER INTERACTION IN AN ACTIVITY OF WRITING AND REVISION

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Abstract. The perspective of situated cognition provides a conceptual framework for studying social mediation in activities of text production. The investigation presented here concerns two forms of social mediation: (1) whole-class interactions that prepare the students for drafting and revising their texts; (2) peer interactions occurring when dyads engage in joint revision of their drafts. The data collected in three fifth-grade classrooms include observations of whole-class interactions, recordings of dyadic interactions and classifications of text transformations that students carried out during individual and joint phases of revision. The analyses examine the relationships between qualitative indicators of interaction dynamics and quantitative data on text transformations. The findings show that differences in the whole-class interactions are reflected in the students’ revisions, particularly with respect to the degree of rewriting that they undertake, as compared to simple error correction. Although analysis of the dyadic interactions reveals important variations in the dynamics of the exchanges, two general findings emerge. In the large majority of cases, the activity of joint revision leads to a substantial increase in the number of text transformations, beyond those made by each author individually. Even in cases where no new transformations occur, the authors engage actively in interaction about revision (e.g., they propose revisions of the other student’s text, explain revisions made individually to their own text, argue against proposals of the other student, etc.). Implications of the results for future research on writing instruction are discussed.

Keywords: Social mediation, whole-class interaction, peer interaction, revision, writing

1 SOCIAL MEDIATION IN CLASSROOM WRITING

The social mediation of classroom learning can be approached from several perspectives, including sociolinguistic studies of the discourse of teacher-student interactions (Barnes, 1976; Cazden, 1986), research conducted in a neo-Vygotskian conception of scaffolding and joint knowledge construction by teacher and students (Bliss, Askew, & McCrae, 1996; Newman, Griffin, & Cole, 1989), analyses of peer interaction in situations of tutoring (Fuchs, Fuchs, Bentz, Phillips, & Hamlett, 1994; Person, & Graesser, 1999) and in cooperative learning activities (Johnson, & Johnson, 1994; Mercer, 1996), investigations of tools that mediate learning in instructional settings (Salomon, Perkins, & Globerson, 1991).
The emergence of the perspective of situated cognition and learning (Brown, Collins, & Duguid, 1989) provides a broader framework for linking and interpreting the different aspects of social mediation in the classroom. This perspective views learning as a process of participation in a “community of practice” (Lave, & Wenger, 1991) that shares values, norms, ways of behaving and of negotiating meaning. In a classroom “learning community” (Brown, & Campione, 1990), the learner actively contributes to the constitution of the shared culture while at the same time developing new skills that incorporate the forms of social interaction and the tools that are valued in the community. Classroom investigations of situated learning (see the review by Allal, 2001) have examined processes of social mediation primarily in three situations: (a) collective, teacher-led interactions that allow the construction of shared norms, practices and knowledge representations; (b) teacher-student interactions, on a one-to-one basis or a small group, in which expert scaffolding or coaching sustains guided practice on the part of the learner, (c) peer interactions which include collaborative exchanges and confrontation of viewpoints.

Research on writing instruction has gradually integrated social constructivist and situated learning concepts. The writing process approach developed by Graves (1983) emphasizes interactions occurring in writing conferences between teacher and students and interactive peer response and critique. Rafiotti’s conception of a “discourse community, where writers, readers and texts come together” (Rafiotti, 1988: 131) offers a framework for approaching the social construction of written communication. The features of a classroom community designed to foster “literacy apprenticeships,” comparable to authentic literacy practices outside school, are defined by Resnick (1990) in the following terms:

Children work to produce a product that will be used by others; they work collaboratively, but under conditions in which individuals are held responsible for their work; they use tools and apparatus appropriate to the problem; they read and critique each other’s writing; they are called upon to elaborate and defend their own work until it reaches a community standard (Resnick, 1990: 183).

There is an increasing amount of empirical research on the role of social mediation in writing instruction at the elementary school level. Englert and her co-workers (Englert, 1972; Englert, Berry, & Dunsmore, 2001; Englert, Raphael, & Anderson, 1992) have investigated the practices that allow literacy apprenticeships to be created and to function productively in classroom communities. Kostoul (2000) explored the way in which student learning about a specific genre is mediated by the discourse structure of the writing conference, and especially by the teacher’s strategies for creating a coherent goal-structure. Allal (2004) studied the implementation and the effects of an integrated, sociocognitive model of learning that included both whole-class interactions and various forms of scripted peer interaction (O’Donnell, 1999). Several studies found that the quality of students’ texts could be enhanced by peer collaboration on joint writing tasks or by reciprocal peer revision of individual work (Dautte, & Dalton, 1988; MacArthur, Schwartz, & Graham, 1991; Saunders, 1989). A study by Zammuner (1995) comparing different conditions of individual and dyadic production and revision concluded that peer interaction was particularly helpful when students wrote texts individually and revised them with a peer who could adopt a detached, critical stance.

The research presented in this chapter is focused on two forms of social mediation studied in a situation of text production and revision: (1) whole-class interactions that precede the students’ drafting and revision of their texts; (2) peer interactions occurring when dyads engage in joint revision of their drafts. We will therefore examine more closely some conceptual issues linked specifically to these topics.

1.1 Whole-class Interactions

Interactions of the teacher with an entire class, also called whole-class discussions (Yackel, & Cobb, 1996), can occur before, during or after activities carried out by students in small groups or individually. These collective interactions are considered to be key moments in the constitution of the “taken-as-shared” meaning of norms and practices in a classroom community (Cobb, Gravemeijer, Yackel, McClain, & White, 1997; Cobb, Stephan, McClain, & Gravemeijer, 2001). There is, however, considerable variation in the terms used to describe the processes involved in whole-class discussions. Cobb et al. (1997) speak of “interactive constitution” of mathematical meaning; Voigt (1994) uses the same term to describe the emergence of interaction patterns; Newman et al. (1989) refer to “collaborative construction” of knowledge in the classroom. In each of these cases, the terms appear to be used in a generic sense to refer to virtually all forms of teacher-student interaction, ranging from the classic IRE sequence (teacher initiation, student response, teacher evaluation) to highly collaborative forms of dialogue. Some authors use terms that emphasize the interdependence of the teacher’s and student’s contributions, for example: “joint constitution” (Resnick, Pontecorvo, & Saljo, 1997); “joint construction” (Salomon, & Perkins, 1988); “co-construction” (Valsinger, 1988).

In order to analyze the whole-class interactions observed in our research, we have adopted the following conceptual distinctions:

- We use the term “constitution” to refer to a continuum of teacher-student interactions. One pole of the continuum corresponds to the classical direct instruction lesson: the teacher presents instructional material, the students listen and carry out any tasks requested by the teacher (e.g., “Take out your dictionary and...” ). The other pole corresponds to situations in which the teacher formulates open-ended questions, stimulates exchanges and debate among students, who compare their interpretations, assess the adequacy of different procedures, and take initiatives that influence the orientation of the discussion. Any segment of a whole-class discussion can be located on the continuum, somewhere between these two poles, providing that the teacher and the students generally respect their complementary roles and thereby contribute to the progression of the instructional activity.

- We have defined criteria to identify the point on the above continuum where it becomes relevant to speak of “interactive construction, joint construction, co-construction” of norms, practices, knowledge and understanding. Our criteria are that: (a) the teacher asks one or more open-ended questions (which may or
may not be followed by more focused questions), and (b) several students give a variety of answers and/or examples that are not already available in the classroom context, that is, that are not present in the teacher’s question, that have not been previously evoked during the same interactive session, that are not provided by an existing documentary source (blackboard, instruction sheet, etc.). These criteria allow us to identify sequences of teacher-student interaction in which students make significant contributions to the constitution of the ongoing instructional activity.

The research on social mediation of classroom writing activities generally recognizes the importance of whole-class discussions, and sometimes presents analyses of this form of interaction (e.g., Englert et al., 1992), but has not developed an in-depth framework of interpretation, comparable to that proposed by Cobb et al. (1997) for the area of mathematics education.

1.2 Peer Interactions

Following the work by Doise, & Mugny (1984) and by Perret-Clermont (1979) on the role of sociocognitive conflict in conceptual change resulting from peer interaction, Gilly, Fraise, & Roux (1988) developed a framework for analyzing a wider range of interactive dynamics in dyadic problem solving. Their research showed that students engage in four main forms of “co-elaboration” of their resolution procedures: (1) agreement (acquiescence): one student makes a proposal, the other expresses agreement; (2) co-construction: each student makes one or more proposals that are complementary to proposals expressed by the other student; (3) confrontation of different proposals by the two students without explicit argumentation about their disagreement; (4) contradictory confrontation with argumentation about the reasons for disagreement. In summarizing their results, Gilly et al. (1988) emphasized the idea that sociocognitive conflict, as manifested in the fourth form of co-elaboration, is a powerful learning mechanism but is not the only source of cognitive progress; the first two forms of co-elaboration, which are collaborative rather than conflictual, also contribute to learning.

This perspective provides the foundation for our analysis of dyadic interactions in a situation of joint text revision. Although previous research on peer interaction in writing did not, to our knowledge, make direct use of this classification system, several studies raised similar preoccupations. Dauzat, & Dalton (1988) showed that collaborative interaction during joint text production included moments of sociocognitive conflict but was largely constituted of implicit, unresolved negotiation, as well as many playful exchanges. A study by Rouiller (summarized in Allal, 2000) identified several features of productive dyadic interactions: In addition to confrontation of viewpoints, students verbalized the successive steps of co-constructed verifications and reminded each other of the need for joint monitoring of the revision process.

1.3 Revision as a Component of Learning to Write

Revision is generally considered to be a key component of learning to write. It is through revision that students can improve their initial drafts, using the tools and resources of social interaction available in the classroom. Revision also stimulates metacognitive reflection about writing (Rouiller, 2004). Since the processes of revision have been analyzed in detail elsewhere (Alamargot, & Chanquoy, 2001a), we will mention briefly only the main concepts used in the research reported here. As described by Witte (1985), revision can occur at any point in the writing process, namely, prior to drafting (pretextual revision of plans), during the drafting of a text (on-line revision), and after having completed a draft (deferred revision). Revision is a complex set of processes that include “reviewing” (reading and evaluating the adequacy of a text), “editing” (correcting spelling, grammar and punctuation errors, making local modifications and lexical substitutions), and “rewriting” (producing new text material that is added to the existing draft, deleting existing passages in a draft, replacing an existing passage by a newly written one, changing the location of a passage within a draft). We use the term “revision” to refer to these processes whether they lead or do not lead to changes in the existing text; the term “transformations” designates the changes actually carried out (Allal, 2000). Transformations are an indicator that revision has occurred but the absence of transformations does not necessarily imply an absence of revision. When an author reads a passage, finds it satisfactory and leaves it unchanged, the revision process in nonetheless present. Learning to revise entails learning when and how to make transformations, as well as learning when not to make transformations.

2 AIMS OF OUR RESEARCH

Within the framework of a longitudinal study conducted in fifth and sixth-grade classes, we are attempting to understand the role of social mediation in text production and revision activities. The present chapter focuses on analyses of data collected in fifth grade regarding: (a) whole-class discussions that precede writing and revision activities and (b) dyadic interactions between students involved in joint revision of individually drafted texts. The principal aim of these analyses is to examine the relationships between the observed processes of social interaction and the characteristics of the texts produced (initial and revised drafts). This purpose is reflected in the following questions formulated for the two directions of analysis.

Regarding whole-class interactions:

- To what extent are there variations in the teachers’ interpretations of the proposed scenario for text production and revision? What types of practices emerge during the whole-class discussions?

We use the terms “reviewing,” “editing,” and “rewriting” as specified above, rather than as initially defined in the Hayes, & Flower (1980) model of writing. This means primarily that “editing” is not considered as an automaic process but as a process involving varying degrees of intentionality and reflection, particularly in the case of young writers who are still constructing base language skills.
• To what extent is there a relationship between the practices developed in each class and the characteristics of the texts produced and revised by the students?
• Regarding dyadic interactions during the students' joint revision of their drafts:
  ▪ To what extent does the activity of joint revision lead to additional text transformations beyond those made individually by the author of each text?
  ▪ In what ways do the patterns of interactive co-elaboration of revision vary among dyads?
  ▪ How are these variations related to the types of transformations carried out during joint revision?
  ▪ To what extent do both members of a dyad benefit from the joint revision activity?
  ▪ To what extent are the dynamics of a dyad's interaction and the resulting transformations affected by the homogeneity of the two students' language skills?

The data available at this stage of our research concern two whole-class discussions (of approximately 40 and 20 minutes) observed in three fifth-grade classes and audio recordings of the interactions (approximately 30 minutes) of one dyad per class. On this basis, it is not possible to determine how each class functions as a writing community over the course of a school year or to identify the general parameters of each classroom's micro-culture, as is done in research conducted by Mottier Lopez (2001) in another context. The analyses presented here have an exploratory character, aimed at defining directions of investigation for future longitudinal analyses of the evolution of social mediation practices and of text transformations between fifth and sixth grades. These analyses provide, nevertheless, a first series of insights into the role of social mediation in the development of fifth-grade students' skills in text production and revision.

3 METHOD

3.1 Context

The research was conducted in three fifth-grade classes (students' age 10-11 years) in the public school system of the canton of Geneva. Two classes were in the same school and the third class in a nearby school. The schools are located in a suburban area where the distribution of the school population shows a slight under-representation of families of upper socioeconomic status (around 12% as compared to 18% in the canton as a whole). In the three classes participating in the study, the percentage of children with Swiss nationality varied widely, from only 36% in class 1, to 56% in class 2 (which is close to the canton average), to a much higher level of 75% in class 3. These differences will be taken into account in the interpretation of the patterns of whole-class interaction.

The three teachers participating in the study were volunteers who had already taken part in previous research studies and/or in teacher training activities. As experienced professionals having taught in elementary school classrooms for over 20 years, they have been involved in a wide range of professional development activities in the area of language instruction and in other areas. Their mastery of teaching skills is presumably higher than that of the overall teacher population of the canton of Geneva.

In each class, one student dyad was selected for audio recording. The teacher was asked to choose a dyad whose members were likely to interact in a productive way and to express themselves freely while being recorded. Our analyses of the dyadic interactions are therefore not representative of the dynamics that may occur when dyad members encounter difficulties of oral expression, or other factors which seriously impede productive exchanges.

3.2 Text Production and Revision Activity

Prior to the writing activity, the teacher was asked to form dyads composed of students who had different (but not widely disparate) achievement levels in French and who were expected to work well together from a social and affective viewpoint.

The activity proposed in each class was based on a situation entitled "The life of a star." The activity involved four main phases: (1) each dyad chose a star (in the area of music, sports, cinema, etc.) that both children admired; (2) each member of the dyad then wrote answers to questions from a journalist who was planning to write an article about the star; (3) the draft of the text was revised individually by each member of the dyad; (4) the two members of the dyad compared their texts to discover if they had imagined the star's life in similar or dissimilar ways; they then confronted their respective revisions and jointly completed the revision of each text.

The writing activity was designed with an authentic communication goal so as to encourage students to produce texts as interesting and as well written as possible. The text genre (a written, autobiographical interview) was familiar to the students since the magazines they read often present this type of interviews with stars who talk about their life, past and present. The questions asked by the journalist were expressed as follows:

- When and how did you begin to get involved in your activity?
- What success was the most outstanding of your career and why?
- What problems do you encounter as a star?
- What advantages do you have as a star?

The writing activity took place in class in three sessions. During the first session, the teacher grouped the students in dyads and each dyad made its choice of a star to write about. In the second session, the teacher introduced the writing activity following a scenario prepared by our research team. This scenario proposed collective discussion of ideas which could be included in the texts and the interactive composition of writing guidelines that the teacher wrote on the blackboard. The guidelines concerned text organization (e.g., choice of verb tense, use of chronological organizers, such as then, later, finally) and language conventions (spelling, punctuation). The students then produced their individual drafts responding to the journalist's questions. The third session began with a reminder by the teacher of the aims of text revision. The teacher also distributed an individual guide to be used during revision that reminded students to verify four key aspects of the texts: quantity and quality of information provided to the journalist, grammatical agreements, spelling, and homo-
phones likely to appear in this type of text. In addition, the teacher led a collective, interactive revision of a sample sentence containing typical errors for the genre under consideration. The drafts were then revised by the two members of the dyad who marked their proposed transformations on two separate photocopies of the text. These individual revisions were followed by a phase of confrontation and joint revision of each text.

4 RESULTS

The results presented here concern, firstly, the interactions between the teacher and the entire class during the phases preceding the drafting and the revision of the students’ texts and, secondly, the interactions between the members of student dyads during the phase of confrontation and joint peer revision. In both cases, qualitative analyses of interactions are combined with quantitative indicators of text transformations in order to answer the research questions presented in section 2.

4.1 Whole-class Interactions

In each of the three classes, a member of our research team observed the whole-class interactions which took place before the students wrote their drafts and, the next day, before they carried out the individual and joint revisions of their texts. All of the indications that the teacher wrote on the blackboard were also recorded. On the basis of these observation notes, a narrative protocol was formulated for each class.

A qualitative analysis was conducted by extracting from the protocols the segments of whole-class interaction which were related to the following aspects of the activity:

- communication context and genre of the text to be written,
- text content and lexical choice,
- text organization and form,
- construction of the writing guidelines (written on the blackboard),
- use of the individual revision guide,
- use of reference materials,
- conception of revision.

For each of these categories, a distinction was made between interaction segments that reflect a process of co-construction, according to the criteria defined section 1.1, and those that do not meet these criteria.

Our presentation here will focus primarily on the variations among the three classes with respect to the practices emerging during the whole-class discussions. It will also seek to determine whether there is a relationship between the practices in each class and the characteristics of the texts produced and revised by the students, as shown in Table 1.

Our observations show that, in all three classes, the teachers follow the main steps of the scenario furnished by our research team; there are no major deviations with respect to the order of the proposed steps or their overall content. There are, however, important differences in the ways in which each teacher interprets the scenario and develops interactions with her class. Of the seven categories used to analyze whole-class interactions, the most salient differences occur for the following three categories.

1. The conception of revision. The teacher in class 2 does not introduce any interactive exchanges about the meaning of the word “revision.” In class 1, the teacher talks about revision as a “critical look” at one’s draft. She associates revision with exercises that the students have previously carried out, such as the classification of errors or the addition of elements (adjectives, relative clauses) to an existing sentence. In contrast, the teacher of class 3 expresses explicitly the idea that revision is not just correction of errors, but also rewriting. “In addition, you can add words, make your text more interesting...delete words...improve the text, change what is written.” She adds a summary of these points to the guidelines on the blackboard. During the interactive revision of the sample sentence, she asks the students to give examples of new ideas that could be added after the sentence.

2. The elaboration of text content. The teachers of classes 1 and 2 lead a collective exchange in which the students propose examples of answers which could be given to each of the journalist’s questions. The teacher of class 3 goes much further in the interactive co-constitution of potential text content. For question 3 she proceeds like the other teachers, but for questions 1, 2 and 4, she asks the students to discuss in small groups (3-4 members) what sorts of answers could be given; she then leads a whole-class discussion that draws on ideas developed in the small-group exchanges. This technique leads to very widespread student participation in the whole-group discussion.

3. The construction of the writing guidelines. All three teachers construct the guidelines with their class, but the construction procedures and outcomes are quite different. In class 1, the teacher asks focused questions about verb tense and organizers during the discussion of the text content and writes a few key words on the blackboard. The guidelines are formulated in generic terms (organizers, spelling, punctuation...), without any examples. The teacher of class 2 marks some general cate-
gories (verb tense, organizers, spelling, ...) on the blackboard before the students arrive. During the whole-class discussion, she has the students give examples that she writes in the appropriate category (e.g., Organizers: when, then, since, in addition..., etc.). In class 3, the teacher stimulates active student participation in the construction of the guidelines and asks for multiple examples to illustrate each guideline. She writes the guidelines in the order of the student suggestions and formulates them in terms of the author's writing/revising activity.

I think about spelling
I think about punctuation
I answer the questions
I write in a logical order
Organizers: before, since, after, then...
I add, I delete, I improve the ideas

The guidelines in class 3 are the only ones specifying that revision entails rewriting (adding, deleting, improving ideas), in addition to editing or error correction. Although the guidelines are expressed in holistic terms, the multiple examples given by the students, as well as the teacher's comments on the examples, constitute a source of contextualization with respect to the communication goal ("Is that interesting for the readers to know?"). The text genre (use of first person pronoun "I" or "we"), the adequacy of content ("Is that an advantage or disadvantage?").

We will now examine the relationships between the qualitative analysis of the whole-class interactions, which we have just summarized, and the characteristics of the students' drafts and revised texts, as shown in Table 1.

Several aspects of the dynamics of the whole-class interactions appear to influence the students' text production and revision. In class 3, where the teacher encourages a broad conception of revision, we observe significantly more rewriting (adding and deleting of words) than in the other two classes. The revised texts in class 3 are significantly longer than those in classes 1 and 2 (a tendency already observed for the initial drafts, although the difference is not statistically significant). The initial drafts in class 3 also contain fewer incorrect words. This suggests that the students of this class are able to carry out more on-line revision during drafting, which could allow them to focus more attention on rewriting during the subsequent revision activities.

The data in Table 1 also shed light on the specificity of the whole-class discussion in class 2. The teacher of this class never talks about rewriting as an aim of revision but instead provides a very structured approach to editing and error correction. This observation coincides with the fact that the students in class 2 attain a significantly higher rate of error correction than in the other classes.

If we look at the density of transformations (i.e., the number of additions + deletions + modifications + corrections per 100 words), we see that this indicator is very similar for classes 2 and 3 (around 18 transformations/100 words), even though the approaches to revision are quite different (more editing in class 2, more rewriting in class 3). In class 1, on the other hand, the students show a much less active engagement in the process of revision.

### Table 1. Characteristics of students' drafts and revised texts, means and standard deviations (in brackets) by class

<table>
<thead>
<tr>
<th>Characteristics of students' texts</th>
<th>Class 1 (n = 14)</th>
<th>Class 2 (n = 18)</th>
<th>Class 3 (n = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drafts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nb. words*</td>
<td>150.0 (12.5)</td>
<td>144.7 (25.0)</td>
<td>160.2 (25.4)</td>
</tr>
<tr>
<td>Nb. incorrect words</td>
<td>26.8 (12.6)</td>
<td>27.0 (12.9)</td>
<td>19.9 (9.4)</td>
</tr>
<tr>
<td>% incorrect words*</td>
<td>18.3 (8.8)</td>
<td>18.9 (8.4)</td>
<td>12.7 (6.1)</td>
</tr>
<tr>
<td><strong>Revised texts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nb. words*</td>
<td>151.1 (13.3)</td>
<td>149.8 (24.1)</td>
<td>173.8 (27.0)</td>
</tr>
<tr>
<td>Nb. words added and deleted*</td>
<td>1.9 (2.8)</td>
<td>11.6 (20.7)</td>
<td>20.8 (14.9)</td>
</tr>
<tr>
<td>Nb. words changed*</td>
<td>11.2 (5.3)</td>
<td>14.8 (8.5)</td>
<td>10.9 (5.3)</td>
</tr>
<tr>
<td>Nb. errors corrected*</td>
<td>7.9 (3.9)</td>
<td>10.9 (5.6)</td>
<td>6.6 (4.3)</td>
</tr>
<tr>
<td>Density of transformations</td>
<td>8.7 (4.1)</td>
<td>18.5 (16.7)</td>
<td>18.1 (8.7)</td>
</tr>
<tr>
<td>% errors corrected</td>
<td>27.4 (13.7)</td>
<td>40.8 (11.7)</td>
<td>33.9 (14.0)</td>
</tr>
</tbody>
</table>

*Univariate analyses of variance show significant differences between the classes for these indicators (p < .05).

In the description of the student population (section 3.1), it was noted that the percentage of Swiss students varies substantially among the three classes. Analysis of variance was used to determine the effect of nationality (Swiss vs. non-Swiss) on the students' achievement levels in French and on the main characteristics of their drafts. An interesting pattern emerges from the analyses. Being Swiss has a significant positive effect on students' grades in "French-communication" and on the number of words in their drafts. The effect of nationality is not, however, significant for the students' grades in "French-basic skills" and for the number of errors in their initial drafts. This suggests that Swiss nationalities are associated with greater language fluency but not with greater mastery of basic language skills. The degree of language fluency of the students in a class, as well as their capacity to "tune in" culturally to the teacher's expectations, could easily amplify the impact of the teacher's strategies for conducting whole-class discussions, thus contributing to the observed contrasts between classes 1 and 3. This tends globally to confirm the idea that classroom interactions are shaped by both teacher and student contributions.

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1 Grades are attributed, on a scale of 1 to 6, for two areas of language instruction: French-communication (reading, oral and written expression) and French-basic skills (conjugation, grammar, spelling, vocabulary).
4.2 Dyadic Interactions

Our presentation of the dyadic interactions recorded during the phase of joint revision takes into account several sources of information. We first present two types of information concerning the individual members of the dyads:

1) The student's achievement level in French, as reflected in first-term grades, for French-communication and for French-basis skills;
2) The characteristics of the initial draft of each student and the types of transformations carried out individually before the phase of joint revision (as described by the indicators in Table 1).

A third source of information concerns the characteristics of the transformations appearing in the final version of each text after the phase of joint revision. This analysis is based on a multidimensional coding system developed in previous research (see Allal, 2000 for a detailed presentation of definitions and criteria). In the present study, coding concerns the following dimensions: object of the transformation (lexical and grammatical aspects of spelling, text organization, semantics, other), type of operation used to make the transformation (addition, deleting, substitution, rearrangement), optional vs. conventional nature of the transformation, effect of the transformation on text quality (positive, negative, ambiguous).

In addition to the above sources of information, we examine the origin of the transformations in order to determine whether the dyadic interaction led to additional transformations beyond those already made by the author during the phase of individual revision. Table 2 presents the five possible origins of the transformations appearing in the final version of each author's text. Categories 1 and 2 concern the transformations carried out by the author that would exist in the final revised draft even if there were not a phase of dyadic peer interaction. Category 1 includes transformations made by the author but not by the peer during their respective revisions; category 2 includes author transformations that are identical to peer revisions, prior to the dyadic interaction. Categories 3, 4, and 5 concern transformations that occur as a result of author-peer interaction, including suggestions provided by the peer (category 3), modifications of the author's initial transformations that result from discussion with the peer (category 4), and new ideas of transformations that emerge during the dyadic confrontation (category 5). The total for categories 3, 4, and 5 reflect the additional transformations resulting from dyadic interaction in the phase of joint revision, beyond those already carried out by the author in the phase of individual revision (categories 1 and 2).

As shown in Table 2, the phase of joint revision leads to a substantial increase in transformations for both members of dyad 2. In dyads 1 and 3, on the other hand, joint revision increases transformations for one member of the dyad (Sonia, Samuel), but not for the other (Anne, Mourad).

<table>
<thead>
<tr>
<th>Origins of transformations</th>
<th>Dyad 1</th>
<th>Dyad 2</th>
<th>Dyad 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Author</td>
<td>Anne</td>
<td>Sonia</td>
<td>Stefan</td>
</tr>
<tr>
<td>2. Author (+ peer)</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>3. Peer</td>
<td>0</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>4. Author + Discussion</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5. Discussion</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>5</td>
<td>13</td>
</tr>
</tbody>
</table>

A final, but most important source of data results from the qualitative analysis of the dynamics of peer interaction during joint revision. This analysis is essential to understand the processes underlying the transformations described in Table 2. For this purpose, we developed a coding scheme derived from previous research on peer interaction. The basic structure of our scheme is based on the categories of interactive co-elaboration defined by Gilly et al. (1988), but, for each category, we have defined sub-categories that take into account several complementary parameters proposed by Baker (2002) and by Kumpulainen, & Mutanen (1999). The recorded protocols of dyadic interactions are divided into sequences of exchanges pertaining to a same object. Sequences are coded and grouped so as to identify the recurrent patterns of interaction that characterize the dyad. The categories for classifying sequences are defined as follows:

- **Agreement**: one student makes a proposal concerning a given object, the other expresses agreement; successive sequences of agreement can be unilateral (only one student makes proposals), or alternating (proposals are made by both students, with some alternation, across different objects);
- **Co-construction**: with respect to a given object, each student makes proposal(s) that are complementary to proposal(s) expressed by the other student and the articulation of these proposals assures a process of joint construction;
- **Confrontation reflecting disagreement**: with respect to a given object, the students express divergent viewpoints; their disagreement can occur with or without argumentation by one or by both students, sequences of disagreement can lead or not lead to resolution of the divergence.

In addition, there are some sequences that begin with disagreement, but move into collaborative co-construction of the solution. In this case, the sequence receives a double code reflecting the two forms of interaction.

We will now draw together the different sources of information concerning the dyad recorded in each class.
Dyad 1
The dyad recorded in the first class is composed of two girls, Anne and Sonia, who chose to write about the singer Lorie. Their levels of scholastic achievement in French are different. Anne's grades in French-basic skills and in French-communication are higher (5, 6) than Sonia's (4, 4). Their drafts show several differences: somewhat surprisingly, Sonia's text is substantially longer (225 words) than Anne's (145 words) and contains a percentage of incorrect words (13%) that is not a lot higher than the percentage in Anne's draft (11%). The number of incorrect words in Sonia's text is of course much larger than in Anne's (16 vs. 30 words).

When carrying out their individual revisions, neither of the authors adds or deletes words from her draft. This observation tends to show that they do not consider rewriting as part of the process of revision. With respect to error correction, Anne is considerably more efficient: she corrects 44% of the incorrect words in her draft, whereas Sonia corrects only 7% of the errors in her draft. The transformations appearing in the final versions of both texts concerning only spelling conventions (lexical and grammatical aspects) and are generally carried out by addition or deletion. The effect on text quality is always positive for Anne's draft, whereas for Sonia's draft, 3 transformations (out of 9) are improvements and the 4 others are not (i.e., errors remain after transformation or new errors are added).

During the phase of dyadic interaction and joint revision, less time is devoted to Anne's text, which is shorter and contains fewer errors, than to Sonia's text (approximately 8 minutes vs. 14 minutes). It is Anne who leads the discussion concerning her own text and who asks Sonia to propose her revisions. Two patterns emerge with respect to Sonia's proposals. In a small number of cases, they are identical to Anne's revisions and are quickly passed in review. In other, more numerous cases, they are incorrect and lead to disagreement with arguments expressed by both students, or sometimes only by Anne. In this second situation, Sonia does not insist very long and generally accepts Anne's refusal of her proposals. Anne sometimes suggests consulting the dictionary in order to determine whether Sonia's proposal is correct. These verifications allow her to ignore Sonia's proposals and retain her own initial revisions. The result, as shown in Table 2, is that no new transformations, beyond those already carried out by Anne, are made during the phase of joint revision.

With regard to the joint revision of Sonia's text, the author takes the lead in reviewing the transformations she has made. She describes the transformations with apparent self-confidence, except for a doubt expressed about one instance of spelling. Anne then takes over and begins reviewing her own transformations of Sonia's text. There is rapid agreement, with little discussion, in most cases, including two proposals by Anne which lead Sonia to modify her draft. When disagreement occurs between the two students, it generally concerns suggestions by Anne. The arguments expressed by the two students show different levels of language awareness: Sonia's arguments appeal to tacit knowledge of what she thinks "seems right."

In contrast, Anne uses linguistic terminology to explain and justify her viewpoint:

The acute "e" accent is wrong because there is a preposition before the verb "to sing."
[in reference to: "ils m'ont aidé à chansons"]

When Anne doesn't find an appropriate argument, she suggests consulting the dictionary. These verifications are carried out collaboratively and constitute the only sequences of co-constructed activity observed for this dyad.

Globally, the interactions in the phase of joint revision have a limited effect on Sonia's text: four transformations are added on Anne's suggestion; one additional transformation is the result of a discussion which leads to an incorrect modification of Sonia's initial correction (see Table 2).

This dyad shows continuous engagement in the task, with almost no "off-task" interactions during the joint revision phase. However, except for the collaborative use of the reference material, the interactive dynamics between the two students do not appear to be very satisfactory. Anne positions herself as the authority of the group; Sonia does not easily accept this authority, especially when modifications of her text are proposed by Anne. This relationship leads to episodes with underlying tensions and overt relational conflicts, which limit the positive effects of the joint revision.

Anne: No, that's not the present perfect. That, it's a preposition (...) So you're wrong. You have to cross out.
Sonia: Yeah, OK, I crossed out (slightly annoyed tone of voice).
Anne: But you haven't really done it!
Sonia: ... I don't know...
Anne: But you have to cross out!
Sonia: But I crossed out! Stop! (deeply annoyed tone of voice).

However, Sonia does not in fact make the correction. Instead she crosses out a letter in the word having no relationship to the discussion with Anne. Even in cases of apparent agreement between the two students, Sonia does not always mark the transformation on her draft or fails to mark it correctly. For example, she agrees with Anne that there is only one "j" in the word "professeur" but only pretends to cross out the extra letter.

Relational tensions between Anne and Sonia appear throughout their interaction and probably explain why no new transformations are elaborated during the joint revision. It is likely that the difference in language skills between the two students (as shown by their grades) contributes to their relational difficulties, but it is also possible that other factors play a role (e.g., their social skills or self-images).

Dyad 2
The dyad recorded in the second class is composed of a girl, Tania, and a boy, Stefan, who chose to write about the master of ceremony of a TV game, Jean-Pierre Foucalt. The students' levels of scholastic achievement are the same in both French-basic skills and French-communication (grade of 3). Their drafts are quite
similar in length (173 words for Stefan and 181 for Tania) and in percentage of incorrect words (25% for Stefan vs. 26% for Tania).

During the phase of individual revision, each author transforms a similar number of words (13 for Stefan vs. 14 for Tania). With respect to error correction, Stefan shows a slightly higher percentage: he corrects 18% of the errors in his draft, while Tania corrects 13% in her draft. Neither student does any rewriting (Stefan adds two words and Tania none at all). The transformations appearing in the final versions of the two texts concern primarily spelling conventions (lexical and grammatical aspects) but there are six transformations of text organization in Tania's draft and one semantic transformation in Stefan's. Transformations of both texts are carried out not only by relatively simple operations of addition and deletion, but also by more complex operations of substitution. The effect on text quality is positive in the vast majority of cases (90% of the transformations of each draft). Taken together, these different indicators show that this dyad is quite homogenous regarding writing and revision skills.

In contrast with the other two dyads, Stefan and Tania begin the joint revision session with an exchange about the content of their texts. They then proceed with the revision of each draft, spending more time on Tania's text than on Stefan's (approximately 13 vs. 8 minutes). The interactive dynamics of the dyad's exchanges are slightly different depending on the text under consideration.

In the joint revision of Tania's text, both students initiate the dialogue alternately. Stefan mostly proposes his own corrections, but he also shows doubts about the way several words are written and identifies some errors not previously seen. Tania mainly asks for Justifications of Stefan's proposals of revisions, either by affirming that what she wrote is correct or, occasionally, by expressing doubt about the spelling of a word. These different ways of conducting the dialogue lead to varied patterns of interaction, including sequences of agreement, of disagreement, as well as episodes of collaborative co-construction.

Agreement takes mostly place by recognizing the relevance of the partner's proposal, which frequently includes a brief explanation:

Stefan: I put a full stop here because if you say...
Tania: Yes it's a little bit too long. But why?...
Stefan: Because you wrote only one sentence, a very long one in fact.

The students resolve the cases of disagreement, by argumentation, by consultation of the dictionary or by asking the teacher. In one interesting exchange, the students compare three spellings for the word "tax" (lots): Tania's initial spelling (ta), the change she made during her individual revision (t'a) and the correction made by Stefan (ta). Not being able to agree on the correct spelling, they decide to look up the word in the dictionary. However, they never get to the word "tax" because they first find the feminine, singular possessive adjective "t'a" (your) which corresponds to what Tania had written initially. They then reason that this word should be put into plural form and so decide to add an "s". This leads to a transformation that looks correct although the underlying reasoning is erroneous. What is particularly striking in this example, we would like to emphasize, is the number of language features being simultaneously dealt with (phoneme-grapheme mappings, contraction with an apostrophe, plural inflections) as the students seek to clarify a problem of homophony, which is one of the very complex and difficult areas to master in written French.

Sequences of collaborative co-construction also emerge during the discussion from a shared doubt about the spelling of a word. Sometimes they lead to correct revisions but sometimes they do not. For example, Stefan asks Tania if she is sure about the way she spelled the word "tellement" (should it be written tellement?). Both students agree to check in the dictionary, they help each other to look for the word but do not find it easily; they finally give up and leave the word uncorrected.

Altogether, interactive dynamics of the discussion results in a large number of new transformations during the joint revision phase. As shown in Table 2, in addition to the 11 transformations Tania initially made, 17 more are added during the dyad's discussion: 7 are proposed by Stefan, 3 result from a discussion that modifies Tania's initial corrections and 7 are new transformations that emerge during the discussion. For example:

Stefan: Well! Here you put an "s".
Tania: Oh yes.
Stefan: It needs a "t".
Tania: Sorry. (She crossed the "s" and marks a "t").

In the joint revision of Stefan's text, it is mainly Tania who leads the discussion. She reviews all the transformations she wrote on Stefan's draft and the author generally expresses his agreement, even when the revisions are not explained by Tania. Stefan's way of initiating certain topics of discussion is to show his own doubts about words he wrote and to describe his difficulty in choosing between two alternatives:

Stefan: Here I wasn't sure if it's "d" acute accent or "ed".
Tania: I wrote it with "d" and I left it that way.
Stefan: OK then.

Subsequently, Stefan points out errors he already corrected himself and occasionally indicates correctly written words in his text, as if to show his partner, and maybe himself, the positive aspects of his production.

To summarize: the majority of the interactions regarding Stefan's text can be classified as sequences of agreement, expressed unilaterally by Stefan to Tania's proposals. The result, as shown in Table 2, is that 13 new transformations, mostly provided by Tania's suggestions (10), are added to the 15 modifications already carried out by Stefan during the individual revision phase. There are nevertheless three cases where the discussion allows the emergence of a new transformation or a modification of an initial revision. These interactions do not, however, lead to any sequences of co-construction.
After having revised both texts, the students check them rapidly once again using the revision guide (for example, they pass quickly in review the number of sentences in each paragraph to be sure there is enough information). It is worth noting, in addition, that this dyad does not engage in "off-task" interactions; during almost half an hour all their exchanges concern the revision task or the content of the texts.

**Dyad 3**

The dyad recorded in the third class is composed of two boys, Mourad and Samuel, who chose to write about the rap singer Eminem. Their level of scholastic achievement is the same in French-basic skills (grade of 4) but Samuel’s grade in French-communication is slightly higher than Mourad’s (5 vs. 4). Their drafts show several marked differences: Samuel’s text is substantially longer (160 words) and contains a higher percentage of incorrect words (21%), as compared to that of Mourad (144 words of which 13% are incorrect).

During the phase of individual revision of their drafts, Samuel added 22 words to his text, while Mourad added only 11 words. With respect to error correction, the students show an equivalent level of success: 33% of the incorrect words in each draft were corrected by the corresponding author. The transformations appearing in the final versions of both texts concern primarily spelling conventions (lexical and grammatical) but there are 2 transformations of text organization in Samuel’s text and a semantic transformation, of varying length, in each student’s text. Transformations of both texts are carried by addition and deletion, as well as by more complex operations of substitution. The effect on text quality is always positive for Mourad’s text and is most often so for Samuel’s text (88% of the transformations are improvements).

In the phase of dyadic exchange and joint revision, much less time is devoted to Mourad’s text than to Samuel’s text (approximately 3 minutes vs. 26 minutes). It is nevertheless Mourad who leads the discussion concerning both texts. For his own text, he passes rapidly in review the corrections he has already made and Samuel generally expresses his agreement. A single case of disagreement entails argumentation by both students about whether the word “audience” [public] is singular or plural. They do not, however, arrive at a shared solution and Mourad retains his own viewpoint. The result, as shown in Table 2, is that no new transformations, beyond those already carried out individually by Mourad, are made during the phase of joint revision.

Although Mourad leads most of the discussion concerning his partner’s draft, Samuel seems quite satisfied that so much time is spent on his own text. The dyad’s interactions can be classified in two main categories. The first includes sequences of agreement. These sequences are generally initiated by Mourad: He reviews the transformations he wrote on Samuel’s text and the author generally expresses his agreement. Samuel points out, however, several transformations he made which do not appear in Mourad’s revisions and Mourad agrees. The second category concerns disagreements. In most of these cases, Mourad’s proposals are finally adopted and marked on Samuel’s text with only a minimal amount of argumentation. There are, however, several cases of in-depth argumentation, including attempts to resolve the disagreement by checking in reference material.

In addition, there are two sequences where disagreement leads to collaborative co-construction of their on-going revision. One example occurs when the two students decide to employ a checking device they have previously learned to distinguish infinitive and past participle forms of verbs (vendre vs. vendu). They review systematically the verbs in Samuel’s text using this device, expressing simultaneous verbalizations of some verifications and complementary collaborative exchanges about others. The second case of co-construction concerns the collaborative search for a word in the dictionary. In both cases, the object of their co-construction is a revision procedure, rather than new linguistic knowledge.

The overall result of these interactions is reflected in the origins of the transformations of Samuel’s text (see Table 2). In addition to the 13 transformations he made initially, 13 more transformations are added during the dyad’s discussion: 8 are proposed by Mourad, 2 result from a discussion that modifies Samuel’s initial corrections and 3 are new transformations that emerge during the discussion.

This dyad makes relatively frequent use of reference materials (dictionary, grammar checklist, conjugation tables), but does not always find a solution to the problem being discussed. For example, when they disagree about the plural ending of a verb (Samuel has used incorrectly the noun inflection “s”; Mourad proposes the correct verb inflection “nt”), they look in the conjugation tables and in the dictionary and fail to find the solution, but Samuel finally accepts Mourad’s proposal.

This dyad often engages in word play while they look in reference books or analyze an expression or word about which they have a doubt. For example, in one long sequence, they go back and forth between two problems: the confusion between homophones (its [seal] vs. its [‘eəsl]) and the spelling of a past participle (annoying [‘emblint]).

**Samuel:** (reading) “it’s very annoying.” But “annoying” is a verb...

**Mourad:** Yes, a verb in the simple past tense, uh, ...a present participle.

**Samuel:** Yeah.

**Mourad:** Yeah, but there is “very” in front.

**Samuel:** Yeah, that’s right: it’s not a verb “very”; i very, you very... [Je très, tu très...].

**Mourad:** Yes, I milk the cow. [Je tran la vache - a play on words with the homophones “très” and “trais”].

The two boys in this dyad often exchange insults expressed in a playful way ("you’re zero," "what an idiot"). They engage in frequent word games, including several “off-task” sequences inspired by words they come across while looking in the dictionary. In one such sequence, the word “grenade” is a starting point for a succession of references to Afghanistan, Ben Laden, the Red Cross, the Salvation Army. In general, their playful and imaginative mode of exchange seems to foster their task engagement rather than distracting them from the goal of text revision.
5 DISCUSSION

Our discussion of the findings of this study will focus, first, on the whole-class interactions, then on the dyadic interactions and, finally, on the possible relationships between these two forms of social mediation of writing and revision activities.

5.1 Whole-class Interactions

Our observations show that even when teachers follow an instructional scenario, such as the one provided in our research, they introduce a substantial range of variation in the way they implement the scenario. This is likely to be true, we think, for all complex instructional activities which imply a certain co-constitution of the activity's content and meaning through the interactions between teacher and students. It also shows the limits of attempts to influence teaching practice by the provision of curricular materials which will inevitably be interpreted in a variety of ways.

By confronting the observations of whole-class discussions in each class with the characteristics of the students’ drafts and revisions, we discover two main differences among the classes. The first concerns the conception of revision formulated by the teacher-student interactions. In the scenario provided to the teachers, the proposed instructions evoked a broad view of revision that included rewriting (“In addition to the correction of existing words, you can add sentences, new words, new ideas. You can also delete words...”). In classes 1 and 2, however, the changes about revision tended to focus exclusively on editing (correction of errors and local improvements, such as enlarging a noun group with an adjective). In class 3, the teacher talked about revision as editing but also as rewriting and she had the students give examples of new ideas that could be added after the correction of the sample sentence. This difference in the whole-class interaction about revision was reflected in the transformations subsequently carried out: a significantly larger number of additions and deletions appeared in the texts of the students in class 3.

The second difference between the classes concerns the overall dynamics of the interactions. In all three classes, there was a considerable amount of interactive constitution of the task requirements. For the different aspects of text production and revision (generation of content, construction of the writing guidelines, revision of the sample sentence), the teacher encouraged the students to give a variety of suggestions and examples. In class 3, however, this process went much further in the direction of co-construction of shared knowledge and practices based on student contributions to the whole-class discussions. The teacher of this class had a greater tendency to encourage students to develop their suggestions and explain their proposals. She also fostered intensive student involvement in the construction of the writing guidelines and in the revision of the sample sentence. The consequences of this strategy are, nevertheless, not that easy to pinpoint. The teacher’s approach apparently reinforced the students’ use of rewriting, but did not necessarily lead to a larger overall amount of revision; the density of transformations (editing plus rewriting, expressed as changes per 100 words) was not higher than in class 2. It is noteworthy that the students of class 3 wrote longer drafts with a lower percentage of errors. The intensive, interactive preparation for writing the initial draft could account for this result in terms of an increased capacity to carry out on-line revision during drafting. In addition, factors linked to nationalities, such as greater language fluency and the ability to tune in to the teacher’s expectations, probably contributed to the differences between class 3 and the other classes.

5.2 Dyadic Interactions

Our analyses of the dyads’ interactions and text transformations show that the sequence of activities—individual revision of each draft, followed by confrontation and joint revision of both texts—had a positive impact on student investment in revision in the sense of increasing the time spent on this task and the number of transformations carried out. In addition, the vast majority of the transformations that were made led to improvement of text quality. Although more extensive revision does not always mean higher text quality (Breiter, & Scardamalia, 1987; Rijlaarsdam, Couzijn, & Van den Bergh, 2004), spending time on revision can be considered as an important (even necessary) condition for learning about writing and for learning, in the long run, how to make significant improvements in text production.

Our observations raise several questions that need to be further elucidated. A first question concerns the composition of the dyads. The literature on group composition (Webb, 1989) shows that learning is enhanced when there is heterogeneity, but a limited degree of heterogeneity, with respect to the relevant skills for accomplishing the task. Groups with members having high and middle-levels skills, or middle and low-level skills generally perform better than groups with high heterogeneity (high and low-level skills) or than homogeneous groups. From this viewpoint, the tension and interpersonal conflict observed in the interactions of dyad 1 were probably caused by the large difference between Anne’s and Sonia’s written language skills. Sonia, the student with the weaker skills, did not want to accept the asymmetry between her role as help-receiver and Anne’s role of help-provider. Affective and social factors linked to self-esteem and identity may have intervened in this case as much, or more than cognitive factors. The productive, dynamic interactions of dyad 2, composed of two students with practically identical levels of language skill, do not at first seem to be consistent with the results of prior research showing the advantages of a certain (limited) heterogeneity. Once again, there may be affective and social dimensions of these students’ interactive styles that provided just the right degree of heterogeneity to stimulate their exchanges in a positive way. Finally, in the case of dyad 3, it was quite obvious that social and affective factors were present in their jostling exchanges of insults and in their word games. This coincides with the research by Dauter, & Dalton (1988) and by Rouiller (2004) showing that an attitude of playfulness can stimulate students’ engagement in writing and revision tasks. In summary, dyad composition needs to take into account a variety of factors – cognitive, affective, social – that can influence the way students carry out a joint activity. It is obviously impossible for teachers to find the right mix of these factors each time they ask students to do group work. It can therefore be useful to introduce whole-class discussions or other techniques (e.g., the scripted interaction formats proposed by O’Donnell, 1999) designed to improve students’ collaborative skills.
A second question concerns the relations between peer interactions and the outcomes of these interactions observed in student productions. If we refer only to the transformations of the students' drafts, we could be tempted to conclude that the activity of joint revision was not beneficial for Anne (in dyad 1) and for Mourad (in dyad 3). In both cases, the moment of joint revision led to no increase in the number of transformations beyond those already produced by the author of the text. Analysis of the interactions showed, however, that Anne and Mourad were very actively engaged in reflection about revision throughout the exchanges with their respective partners. Anne verbalized explanations and justifications for carrying out, or not carrying out, different transformations of her own draft and of Sonia's text. Mourad was also very active in the lengthy discussion about Simon's text; he led a major portion of the review and was constantly involved in the search for solutions either by argumentation or by looking in reference materials. In terms of "time-on-task" (Berliner, 1979), Anne and Mourad worked steadily on revision during the dyadic interaction even though no new changes were introduced in their own drafts. To summarize: when new transformations occur during joint revision they are generally a sign of positive involvement in the revision process, but their absence does not preclude active investment in reflection about revision of one's own or one's partner's text. This observation concides with Rijaarsdam et al.'s (2004) affirmation that transformations are only the "tip of the iceberg" and do not convey fully the underlying process of revision.

With respect to the question "what are the effects of the revision activities carried out in our study on student learning?", we have no direct measures but we can formulate the following interpretations based on our observations:

- Sonia's text improved slightly (in terms of error correction), but she probably failed to learn anything about text revision; most of her energy was spent resisting, and occasionally giving in, to Anne's suggestions.

- The other five students all invested actively in the revision activity. A sizeable number of transformations (13-17) were added to three students' texts, but no new transformations were made on the remaining two drafts. It is nevertheless likely that all five of these students learned something from the dyadic interaction about the aims and the practice of revision.

Although their revision activity was largely focused on the area of spelling (lexical and grammatical aspects), they engaged in practices that elicited a range of language skills: comparison, justification, explanation, use of reference materials. It can be noted, moreover, that exchanges about some aspects of spelling entailed quite a complex coordination of several concepts, as illustrated by the to-von-tas example discussed by Tania and Stefan. As other research has shown (Allal, 2004; Béatrix Köhler, 1995; Largy, Chanequey, & Dédéyan, 2004), the mastery of French spelling, especially the grammatical aspects, the problems of homophony and the presence of unvoiced letters, remains a challenge for young writers throughout the elementary school years. The cognitive resources that the students have to invest to try to solve spelling problems may explain in part why they carry out relatively few transformations concerning text organization and semantics.

5.3 Relations between Whole-class and Dyadic Interactions

The theories of social mediation of learning lead us to expect relations between the representations and the practices constituted during whole-class discussions and the ways students function and interact in small-group situations of peer interaction. In the first part of our longitudinal study, concerning three fifth-grade classrooms, it was not, however, possible to go very far in analysis of these relations. Having recorded and transcribed the interactions of only one dyad per classroom, we are not able to determine whether the differences among the dyads are influenced by the differences among the whole-class discussions that took place in the three classes. In the second part of our study, extended to the same classes in sixth grade, two dyads per class are recorded so as to facilitate the search for influences of whole-class discussion on peer interaction.

We can mention, nevertheless, in conclusion, several hypotheses based on our fifth-grade observations to be explored further in the future. The whole-class discussions we observed included the construction of writing guidelines which could be used for both drafting and revising. Although we observed very few signs that the students explicitly referred to these guidelines, their drafts and the revisions they subsequently made were often very congruent with the guidelines. This suggests that the interactive construction of the guidelines was more a means of structuring (mentally) the students' approach to writing and revision than a way of giving them a tool used operationally during these activities. This hypothesis could be investigated by comparing a situation in which guidelines are constructed and remain available during writing/revising with a situation in which guidelines are constructed but do not remain available during writing/revising.

A second area of investigation concerns what Newman et al. call the "intermediacy" of teacher-student interactions. They state that in an instructional dialogue, "the participants act as if their understandings are the same" (Newman et al., 1989: 62) while they gradually advance in the negotiation of meaning. This could lead us to look at peer interactions, which follow whole-class discussions, in terms of the elements that reveal discontinuities in the process of co-construction of shared knowledge and practices. For example, although the conception of revision verbalized in class 3 apparently influenced the students' revisions (i.e., they carried out more rewriting than in the other cases), the interactions of the recorded dyad made very few references to text content and the process of transforming content; almost all the students' exchanges were focused on operations of editing. This may show that the initial impact of whole-class discussions is on cognitive processes (in the present case, how to write and revise a text) rather than on metacognitive reflection about these processes. By studying several cycles of whole-class and small-group peer interaction, it would be possible to determine how the co-construction of representations and practices may be extended toward shared metacognitive reflection about the social mediation of learning.
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Whole-class and peer interaction


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