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SOCIO-COGNITIVE CONFLICT AND THE ROLE OF STUDENT INTERACTION IN LEARNING

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Work on socio-cognitive conflict has shown that confrontations can benefit learning when conflict is regulated in an epistemic manner, but can hinder learning when conflict is merely relational. The present research links this line of research to the work on peer learning, that has indicated that the partner's competence can be beneficial when working on complementary information, but detrimental when working on identical information. Two studies showed that student confrontations during peer learning can be beneficial when working on complementary information, but detrimental when working on identical information.

Keywords: *socio-cognitive conflict, peer learning, student interaction*

Le Conflit sociocognitif et le rôle de l'interaction entre étudiants dans l'apprentissage
Les travaux réalisés sur le conflit socio-cognitif montrent que les confrontations peuvent favoriser l'apprentissage lorsque le conflit est régulé sur un mode épistémique, et au contraire l'entraver lorsqu'il est purement relationnel. Le présent article établit un lien entre cette approche est le travail fait sur les échanges entre pairs et leurs effets sur l'apprentissage, qui montre que la compétence d'un pair peut s'avérer positive lorsqu'elle s'applique à une information complémentaire, mais au contraire négative lorsqu'elle s'applique à une même information. Deux études suggèrent que, dans le cadre de l'apprentissage entre pairs, la confrontation entre étudiants peut s'avérer positive lorsqu'elle s'applique à une information complémentaire, mais au contraire négative lorsqu'elle s'applique à une même information.

Mots-clés: *conflit sociocognitif, apprentissage de pairs, interaction entre étudiants*

INTRODUCTION

The social development of the intellect is one of the first research programmes developed in Geneva by Willem Doise, and one that has been particularly productive (e.g. (Doise & Mugny, 1984, 1997; Doise, Mugny, & Pérez, 1998). The basic idea is that children develop their understanding of the world, as well as their cognitive tools, by interacting with other individuals, be they other children or adults. The key mechanism responsible for this development is what has been called socio-cognitive conflict, defined as the confrontation of points of view between individuals. The present article aims at contributing to this line of research by specifying the links between student interactions and learning.

Socio-Cognitive Conflict and Learning in Dyads and Small Groups

Research on socio-cognitive conflict has examined the effects of this conflict in both actual student interaction situations (e.g. Doise & Mugny, 1984; Johnson & Johnson, 1995) and in symbolic interaction without actual presence of the source (Pérez & Mugny, 1996). One of the most important ideas of this line of research is that learning is not a mere product of imitation, but it can result from socio-cognitive construction, that is elaboration of new cognitive schemas or new knowledge, on the basis of the articulation of different points of view. This idea was supported by research on interaction between children differing in cognitive levels, showing that both the child at the lower level and the child at the higher level can progress, provided that the more advanced child does not impose his/her own answer (Mugny & Doise, 1978). The progress of the higher-level child suggests that the enhanced performance induced by the socio-cognitive conflict is not merely a consequence of imitation. Consistent with these results, it has been shown that children confronted with a partner proposing an erroneous response at the same low cognitive level (Ames & Murray, 1982; Doise & Mugny, 1979; Mugny, Giroud, & Doise, 1978-1979, study 2) or even at a lower level (Mugny, Lévy, & Doise, 1978) progressed significantly on an individual post-test. In sum, conflict indicates that other perspectives exist, raises doubt about one's own point of view and creates disequilibrium (Piaget, 1975). Accordingly, children, but also adults, are led to decenter from their own point of view and to coordinate the different views (cf. Butera & Buchs, in press). This coordination can lead to a higher-level cognitive organization and to new knowledge.

This notion of socio-cognitive conflict has also been successfully introduced to understand progress in school tasks, both in Europe (Foot & Howe, 1998; Perret-Clermont & Nicolet, 2001) and in the USA (cf. Deutsch & Coleman, 2000; Johnson & Johnson, 1995). Therefore, confrontation of points of view seems to be an effective mechanism for cognitive development and knowledge acquisition. Nevertheless, the above research also pointed out that not all confrontations are beneficial; confrontations involve both constructive and detrimental elements, depending on the way in which conflict is regulated at the interpersonal level

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(Buchs, Butera, Mugny, & Darnon, 2004). Indeed, research on socio-cognitive conflict has investigated two main types of conflict regulations influencing cognitive outcomes. Conflict regulation can be socio-cognitive (also called "epistemic"), that is focused on the epistemic motivation to solve the task and to acquire new knowledge; conflict regulation can also be relational, that is focused on social comparison of competence (Carugati, De Paolis, & Mugny, 1980-1981; De Paolis & Mugny, 1991; Mugny, De Paolis, & Carugati, 1984; see also Quiamzade & Mugny, 2001). Research in this domain has argued that conflict is beneficial for cognitive development only when it is regulated in a socio-cognitive manner; as soon as relational regulation predominates, the benefits of confrontation are lowered (Doise & Mugny, 1984).

Moreover, two types of relational regulations can be identified depending on the elicited social comparison process. On the one hand, social comparison can lead to acknowledging one's own inferiority, and to compliance by accepting the partner's point of view through mere imitation. Research has shown that compliance reduces cognitive benefits (Mugny et al., 1984; Mugny, Doise, & Perret-Clermont, 1975-1976), whether it be compliance due to unilateral decisions in peer learning (Carugati et al., 1980-1981; Mugny & Doise, 1978), to asymetric adult-child relationships (Mugny et al., 1978-1979, study 1), or to concurrence-seeking assignments (see Johnson & Johnson, 1995). On the other hand, social comparison can also elicit defensive strategies in order to protect one's own competence, that is competitive relational regulation. In this case, demonstrating that one is right and that the partner is wrong might become a stronger motivation than processing the information in depth. The negative effects of this competitive relational regulation have been shown in studies where social comparison was elicited both by negative judgments about competence (Monteil & Chambres, 1990; Tjosvold, Johnson, & Fabrey, 1980; Tjosvold, Johnson, & Lerner, 1981), and by a competitive context (see Johnson & Johnson, 1995). Research conducted on social influence in aptitude tasks supported these results in studies where conflict occurred both between high-competence participants (Butera, Gardair, Maggi, & Mugny, 1998; Butera & Mugny, 2001), and between low-competence participants (Butera & Mugny, 1995). Other results indicate that, as the competence threat is removed, participants attribute competence both to the self and to the partner, and process more deeply the information that the latter provides (Butera, Mugny, & Tomei, 2000; Mugny, Butera, & Falomir, 2001).

Information Distribution and Student Interactions in Peer Learning

Notwithstanding the impressive amount of data produced by the socio-cognitive conflict research program, little attention has been paid to the role of actual interaction processes on learning and development, with the exception of the clinical observations presented in Doise, Mugny and Perret-Clermont (1975, exp. 1) and in Mugny, Giroud, and Doise (1978-1979, exp. 2). However, in the peer learning literature one important variable has been shown to impact student interaction: task structure, and in particular the type of information distribution. This is important because it can be argued that the way in which the task is structured determines the way in which students interact, which in turn can affect learning. Information distribution refers to resource in(ter)dependence in cooperative learning (Johnson & Johnson, 1989; Johnson, Johnson, & Stanne, 1989; Ortiz, Johnson, & Johnson, 1996). In positive resource interdependence condition, students work on complementary information (each member accesses only one part of the needed information so that information has to be combined), whereas in resource independence, students work on identical information (each member accesses all the information). Dynamics elicited in the two peer learning methods are summarized in Table 1.

Recent results (Buchs, 2002; Buchs, Butera, & Mugny, 2004, study 1) showed that working on complementary information encouraged positive interactions (more positive reactions), strengthened cooperation (more responses) and involvement (summarizers spent more time to give explanation, introduced more ideas in their summaries, listeners ask more questions). This is consistent with results showing that positive interdependence reinforces individual accountability and responsibility (Cohen & Cohen, 1991). Key mechanisms in positive interdependence are the representation of knowledge as a coordination of point of view—stressing the relevance of the relation with the partner

TABLE 1 SUMMARY OF DYNAMICS ELICITED BY INFORMATION DISTRIBUTION.

	Identical information	Complementary information
Relation relevance	Weak	Strong
Climate	Individual / competitive	Cooperative
Students involvement	Average	Strong
Type of interactions	Discussion / confrontations	Summary / questions / explanations
Individual accountability	Average	Strong
Reciprocal interdependence	Weak	Strong
Inclination toward social comparison of competences	Strong	Weak
Partner's competence	Threatening and detrimental	Welcomed and beneficial
Relevant mechanism	Competence threat: Competitive relational activities as mediator	Informational dependence: Quality of informational input as moderator

(Gruber, 2000) – and reduced social comparison of competence – thanks to incomparability and decentering (Butera & Buchs, in press). Nevertheless, to accurately report complementary information, a good-quality informational input from the partner is required (Buchs & Butera, in preparation; Buchs, Butera, & Mugny, 2004). In sum, the quality of the partner's informational input moderates the positive effect of working on complementary information.

Conversely, Buchs et al. (2004) showed that student interactions – both observed (study 1) and reported (study 2) – are more confrontational when they work on identical information: The relationship between partners is more competitive (more observed negative reactions in study 1, and more reported competitive relational activities in study 2), and the partner's competence appeared to be threatening for one's own competence and detrimental for learning. Moreover, results indicated that competitive relational activities mediated the detrimental effect of working on identical information. Therefore, it was proposed that confrontations might be regulated in a competitive relational way when working on identical information. In the present article, two studies manipulated information distribution, with the aim of linking the specific student interactions elicited by information in(ter)dependence to learning.

STUDY 1

The aim of Study 1 was to test the relation between actual interaction processes and learning in peer work. Two predictions can be proposed. First, partners' involvement will benefit learning (Johnson, Johnson, Roy, & Zaidman, 1985; Spurlin, Dansereau, Larson, & Brooks, 1984; Webb, 1991). Secondly, confrontation should be beneficial for learning only when regulated in epistemic way; competitive relational regulation will prevent confrontation from being beneficial. Therefore, it can be expected that confrontations will be positively linked with learning only when students work on complementary information, and not when they work on identical information. It is important to note that the present study consists of a re-analysis of data obtained by Buchs et al. (2004, study 1); at that time the link between student interaction and learning had not been studied.

Method

Participants.

Sixty-four second-year Psychology students at Grenoble University participated in this study. Experimental dyads were constituted by same-sex students who did not know each other and were kept the same for the three dyadic-work sessions (16 dyads worked on complementary information and 16 dyads worked on identical information). As regards the individual learning measured during a fourth session, data were available from only 47 of the original 64 students. Due to various technical problems, some videotapes were not available; 42 videotapes were available for all sessions and were included in the analysis, which allowed us to link interaction processes to performance.

Procedure.

This experiment took place during regular social psychology workshops. Students worked either on identical information or on complementary information (social psychology texts) during three two-hour sessions. The roles, the nature and timing of activities of the participants were specified by assignments: Students had 20 minutes to read silently the first text followed by a 10-minute discussion, and the same procedure was repeated for the second text. For each text, one student played the summarizer role and the other the listener role (see Dansereau, 1988); roles were reversed from one text to the other.

Independent Variables.

For each session, students worked on two social psychology texts. When students worked on complementary information, only one student read the first text (while the partner read a non relevant paper in order to maintain attention) and played the summarizer role during discussion. Roles were reversed for the second text. When students worked on identical information, both students read the first text, and one of the students played the summarizer role during discussion. Roles were reversed for the second text. For both conditions, summarizers had to explain the text in detail, while their listeners had to help them by asking questions, requesting clarifications or bringing up remarks.

Dependent variables.

Recall. Before they started the traditional – non-experimental – fourth session, students were given an ad hoc booklet, in which they were asked to write down all the pieces of information they could recall about the six texts studied during the 3 dyadic sessions. This written recall took place one to four months after the dyadic sessions, depending on the texts. Of the 64 students, 47 were present for the recall task (26 in the resource interdependence condition and 21 in the resource independence condition). This recall was then evaluated by two social psychology teachers, and rated from 0 to 5.

Partner involvement. Time devoted to give explanation or summarize information, number of questions and number of responses to questions were coded. Therefore it was possible to code the number of non-responses (number of questions asked – number of responses received).

Opposition activities. Time allocated to confrontations of points of view, that is when partners disagree and defend their positions.

Results

Hypothesis 1: Link Between Partners' Involvement and Recall.

Students' involvement is expected to be beneficial for learning. This hypothesis can be decomposed in three specific hypotheses. H1a: Time allocated to giving explanation will be positively related to student recall. H1b: Clarification requests from listeners will encourage deeper processing of information by summarizers. H1c: Lack of response to requested help will be negatively linked to listeners' recall.

H1a: Giving explanations. As displayed in Table 2, the amount of time devoted to giving explanations tended to be positively linked to the participants' recall, that is recall of the participant giving the explanation ($r(42) = .27$, $p < .09$), but not with their partner's recall ($r(42) = -.05$, $p > .10$). Separating roles indicated that this pattern was due to summarizers' explanations. Time that summarizers allocated to explanations was actually positively related to the

TABLE 2 CORRELATIONS BETWEEN STUDENT INVOLVEMENT AND RECALL (STUDY 1)

	Giving explanation			Asking questions			Giving responses			Giving no response		
	overall	Sum.	List.	overall	Sum.	List.	overall	Sum.	List.	overall	Sum.	List.
Own Recall	.27*	.37**	.19	-.05	-.10	-.26*	.34**	.46***	.18	-.21	-.38**	.09
Partner's recall	-.05	-15	-.27*	.29*	.18	.34**	-.03	-.22	-.14	-.07	-.14	-.03

Note: * p < .10, ** p <.05, *** p < .01

summarizers' own recall ($r(42) = .37$, $p < .02$) but not with the listeners' recall ($r(42) = -.15$, $p > .10$). The relation between time summarizers allocated to explanation was more positively linked with their own performance than with their partner's performance ($Z = 2.38$, $p < .02$). In contrast, time listeners allocated to explanation was marginally negatively link with their summarizers recall ($r(42) = -.27$, $p < .08$). The relation between time listeners allocated to explanations and listeners recall ($r(42) = .19$, $p < .10$) was not significant but not as negative as for the summarizers recall ($Z = 2.07$, $p < .04$).

It is worth noting that the more summarizers devoted time to explanation, the less listeners took time to give explanations ($r(58) = -.48$, $p < .001$). Therefore, the more the summarizers assumed their role in giving explanation, the better they could recall information, but the less their listener could give their own explanation. In contrast, the more listeners imposed their own explanations, the more they prevented their summarizers from recalling better.

Therefore, giving explanations was positively related to the performance of the one explaining, but not to his or her partner's performance.

H1b: Clarification requests. In the present study, overall correlation indicated that the number of questions asked by students was marginally and positively related to partners' recall ($r(42) = .29$, $p < .07$). Nevertheless, asking questions was not related to participants' recall ($r(42) = -.05$, $p > .10$). Asking questions had no relation with the recall of students who asked questions, but was positively linked to the performance of partners being asked. To test our prediction, behaviors displayed by listeners was isolated and then correlated with the summarizers' and listeners' recall. The fact that listeners asked questions when listening to their partners summarizing was especially beneficial for the summarizers' recall ($r(42) = .34$, $p < .03$), but tended to be negatively related to listeners' recall ($r(42) = -.26$, $p < .09$). Listeners' questions were of more benefit to summarizers' than to listeners' recall ($Z = 2.78$, $p < .01$). As for questions from summarizers, no correlation reached significance.

In the same line, the number of responses that students gave was positively correlated with their own recall ($r(42) = .34$, $p < .03$). No relation was found between the number of responses that students gave to their partners and partners' performance ($r(42) = -.03$). Separating roles indicated that this pattern was due to the responses given by the summarizers. The number of responses that summarizers gave was positively correlated with their own recall ($r(42) = .46$, $p < .01$), but was not related to their listeners' performance ($r(42) = -.22$). Summarizers' responses were more strongly related to summarizers' recall than to listeners' recall ($Z = 3.28$; $p < .01$). Therefore, listeners' activity of clarifications seems to be beneficial especially for summarizers. This idea is supported by results regarding no responses.

H1c. No responses. The extent to which summarizers failed to respond to listeners' questions was negatively linked to summarizers' recall ($r(42) = -.38$, $p < .05$), but was unrelated to listeners' performance ($r(42) = -.14$). No other correlation was significant.

H2. Link between Confrontations and Recall.

Doise and Mugny's work leads to the prediction that confrontation of different points of view and socio-cognitive conflict could be beneficial for learning. In the present study, students' active confrontation is not related either to students' recall ($r(42) = -.04$), or to partners' recall ($r(42) = -.10$). However, confrontations are supposed to be beneficial for learning only when they are regulated in epistemic way. Therefore it is interesting to separate results obtained in the two peer learning methods: It can be expected that confrontations will be more positively linked with learning when students work on complementary information than when they work on identical information.

Table 3 shows that when students worked on identical information, recall was not related to time allocated to confrontation. In contrast, when students shared complementary information, active participation in confrontation of points of view was positively related to summarizers' recall. Indeed, as far as summarizers' performance are concerned, time allocated by summarizers to confrontations was positively correlated to summarizers'

TABLE 3 CORRELATIONS BETWEEN STUDENTS' CONFRONTATION AND RECALL (STUDY 1)

	All dyads			Identical info			Complementary info		
	overall	Sum.	List.	overall	Sum.	List.	overall	Sum.	List.
Own Recall	-.04	-.19	.02	-.09	-.16	-.18	.31	.48**	.01
Partner's recall	-.10	-.04	-.11	-.22	-.34	-.11	.32	.01	.47**

Note: *p < .10, ** p <.05, *** p < .01

recall ($r(23) = .48$, $p < .02$). Moreover, time allocated by listeners to confrontations was also positively correlated to summarizers' recall, and nearly identical to the previous correlation ($r(23) = .47$, $p < .03$). Nevertheless, no correlation was significant for listeners' recall.

Discussion

In sum, correlation analyses indicated that the amount of explanations was positively linked to the recall of students giving explanations. This pattern can be explained by the fact that the more one participant took time to explain, the less his or her partner did. Time that summarizers devoted to summarize and give explanations, as well as the number of questions from listeners, were positively linked to summarizers' recall. It seems that listeners' activities were positive for summarizers as long as listeners stayed in their listeners roles (asking questions); when they assumed activities linked to the summarizers' role (giving explanation), the benefit for summarizers decreased. On the other hand, regarding relations between listeners' activities and listeners' recall, asking questions seemed to be negatively linked to recall performance. It seemed more beneficial to give responses than to receive responses. Results on the relation between confrontations and recall support the hypothesis of a negative impact of social comparison of competences when discussing identical information. In the present study, even if confrontations were more important when students discussed identical information, in this condition no correlation between time allocated to confrontation and recall was significant. It is worth noting that all relations were negative. In contrast, when students shared complementary information, time that students devoted to confrontation of points of view is positively correlated with summarizers' recall.

STUDY 2

The aim of Study 2 is again to investigate the relation between student interactions and learning, but this time by studying perceived interaction, which can be instructive to assess behaviors not easily observable as confrontations or relational activities. The present study consists of a re-analysis of data obtained by Buchs et al. (2004, study 2); at that time the link between student interaction and learning had not been studied. It is predicted that confrontations will be less positive when working on identical information than on complementary information.

Method

Participants.

Thirty-six second-year Psychology students at Grenoble University participated in this study. As for study 1, experimental dyads were constituted by same-sex students who did not know each other and were kept the same for the three sessions (20 students worked on complementary information and 16 students worked on identical information).

Procedure.

The procedure was the same as for the first study: students worked in cooperative dyads for three sessions. Again, participants where given either complementary or identical information, and played summarizer and listener roles. The only differences concerned the dependent variables.

Dependent variables.

Multiple Choice Test. Learning was assessed through a Multiple Choice Test (MCT). Four questions for each text were introduced in this MCT (two recall questions and two comprehension questions). This MCT took place four weeks after the last dyadic-work session.

Dyadic consensual activities. Four questions concerned the time that dyads devoted to questions and clarifications, bringing up clarifications, care that both partners had understood information, propose strategies and remind information ($\alpha = .74$). Students were asked to evaluate time devoted to these activities on a 7-point scale ranging from 1 (little time) to 7 (much time).

Dyadic confrontation of points of view. Level of confrontation inside dyads was assessed by four 7-points scale questions. These questions concerned time devoted by dyads to confrontation of different points of view, to defend and argue ideas, to try to impose points of view and to try to understand alternative points of view ($\alpha = .79$).

Individual epistemic activities. Four other questions concerned frequency of student activities during discussion: What was the frequency of trying to summarize information as clearly as possible, of wondering how to conciliate different points of view, of integrating what was discussed to prior knowledge, of thinking to concrete example ($\alpha = .65$). Students answered on a 7-points scale ranging from 1(very infrequent) to 7 (very frequent).

Individual competitive relational activities. Relational activities, that is activities related to social comparison of competence and protection of one's own competence, were also assessed by self-report. The four questions concerned the frequency with which students checked that what their partner said was correct, evaluated their partner's competence, presented themselves as more competent than their partner, and wondered how to look competent ($\alpha = .84$). Students rated frequency on the same 7-points scale as above.

Results

In order to test that the relation between student interactions and learning can be moderated by the way peer learning is structured, a regression analysis was conducted to predict achievement in the MCT. Information distribution (-1 for working on identical information; +1 for working on complementary information), dyadic confrontation of points of view, dyadic consensual activities, individual epistemic activities, individual competitive relational activities (all were statistically centered), and interaction between each of these variables and information distribution, were entered as predictors. Results are displayed in Table 4.

Information distribution was not significant in itself in this equation (b=-11, $p > .10$). Regarding the effects of perceived interaction, only the effect of individual competitive relational activities is significant ($b = -.34$, $p < .02$). As predicted, the more students have reported individual competitive activities, the poorer was their MCT score. The interaction is not significant ($b = .13$, $p > .10$). Table 5 specifies that individual competitive relational activities were negative for MCT score in both peer learning methods ($r(17) = -.31$, $p > .10$ when working on

TABLE 4 REGRESSION COEFFICIENT (B) FOR PREDICTORS OF THE MCT.

	Dyadic confrontation of points of view	Dyadic consensual activities	Individual epistemic activities	Individual competitive relational activities	R^2
Variable	-.15	-.41	.35	-.34**	
Information Distribution* variables	.42**	.05	-.34	.13	.48

Note: *p < .10, ** p <.05, *** p < .01
Information distribution b=-11

complementary information and $r(11) = -.73$, $p < .04$ when working on identical information; these two correlations did not differ $Z = 1.37$, $p > .10$).
Regarding the interaction effect, Table 4 shows an interaction between information distribution and dyadic confrontation of points of view ($b = .42$, $p < .03$). Therefore, the relation between perceived confrontation and performance differs in the two peer learning methods. As can be seen in Table 5, perceived dyadic confrontation is negatively related to performance only when students worked on identical information ($r(11) = -.75$, $p < .04$) and not when working on complementary information ($r(17) = .27$, $p > .10$). Confrontations are more negatively related to performance when working on identical information than on complementary information ($Z = 2.82$, $p < .01$).

TABLE 5 PARTIAL CORRELATIONS WITH MCT IN BOTH INFORMATION DISTRIBUTION CONDITIONS

	Dyadic confrontation of points of view	Dyadic consensual activities	Individual epistemic activities	Individual competitive relational activities	R^2
Complementary information ($N = 17$)	.27	-.37	.01	-.31	.28
Identical information ($N = 11$)	-.75**	-.48	.61	-.73**	.64

Note: *p < .10, ** p <.05, *** p < .01

Discussion

In this study, self-report measures assessed perceived interactions between partners during peer learning. It appeared that the perception of competitive activities undermined learning, thereby supporting the view that learning is impaired by relational confrontations (Doise & Mugny, 1984). Even more interestingly, it appeared that perceived confrontations of points of views during interaction play a different role as a function of the task structure. It is when the structure of resource distribution underscores the social comparison of competences (with identical information, see Table 1), that confrontations become highly detrimental for learning.

GENERAL DISCUSSION

The aim of the two studies presented here was to specify the links between student interactions and learning in peer work, using both videotaped interactions (study 1) and perceived interactions (study 2).
The first study showed consistent results with the literature on cooperative learning and peer learning. Indeed, giving explanations has been positively related to learning but not to receiving explanation (see Annis, 1983; Bargh & Schul, 1980; Johnson et al., 1985; Webb, 1991); moreover, receiving no response to solicited help was strongly detrimental to performance (Webb, 1991). Therefore, the roles assigned seem to be more positive for summarizers than for listeners. These results underlined the need to reverse roles during peer learning in order to maximize the learning of both partners.
The two studies also specify Doise and Mugny's (1984) work on the effect of confrontation of different points of view for learning. It was proposed that these confrontations should be positive when students' work on complementary information because the cooperation and decentering elicited in this situation should encourage an epistemic regulation. In contrast, when students worked on identical information, the focus on social comparison of competence and competence threat elicited by this situation should orient students towards a relational regulation, less positive for learning. Study 1 indicated that the relation between confrontation and learning differs depending on the situation. Time devoted to confrontations was positively related to performance only when students worked on complementary information. Moreover, time devoted both by summarizers and listeners to confronting ideas was beneficial for summarizers' performance. Study 2 allowed assessing confrontations that are not directly observable, as well as relational activities, thanks to self-reports. Results again indicated that confrontations did not have the same effect on identical as on complementary information. The relation between confrontations and learning seemed to be positive when students worked on complementary information, but did not reach conventional level of significance. In contrast, confrontations were strongly and negatively related to performance when students worked on identical information. It is worth noting that individual competitive relational activities were generally negative for learning.
Taken together these two studies indicated that confrontations of different points of view were more positive in a cooperative context (when students worked on complementary information) than in a more competitive context activating a relational regulation (when students worked on identical information). These studies underline that Doise's seminal work on socio-cognitive conflict is indeed relevant to understand peer learning. In fact, his work, which was originally devised to study children interacting on developmental tasks, created a very broad framework that proved to be highly relevant and useful to understanding very diverse phenomena in university student learning.

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