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Actual and perceived expertise: the role of social comparison in the mastery of right and left recognition in novice-expert dyads[1]

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In line with the post-Piagetian strand, this article presents a study exploring the role of social comparison with regard to the individual benefits children might gain after a peer interaction session. 52 7–8 year-old children participated in the experiment. The task involved the recognition of right and left on one's own or another's body. The experimental design was a classical pretest-post-test design including an additional session in which the perceptions each child had of his/her own level of expertise and that of the partner were manipulated just before an interaction session between an expert and a novice. The experimental manipulation consisted of inducing either an unequal (condition 1) or an equal (condition 2) perception of the expertise. Results showed that condition 2 brings about more progress among the novices than condition 1 in the substests which are the most easy to solve. Additional results concerning some characteristics of the interaction session are also reported.

Introduction

The aim of this article is to present an experimental study concerning the role of social comparison with regard to the individual benefits children may gain from a peer interaction session. This study is part of a longstanding strand of research pertaining to a post-Piagetian tradition and concerning the role of peer interaction in cognitive development.

Since research into the role of peer interaction in cognitive development has been considerably expanded in recent years, we only give a short outline in order to make explicit the theoretical and empirical assumptions underlying the present study. It is in fact worth noting that such studies have been carried out not only in the post-Piagetian field in which they were first initiated, but also in other fields in particular within the post-Vygotskian strand. The latter first focused upon the guidance strategies adults (mostly mothers or teachers) use to help the child carrying out a task in formal or informal contexts (Elbers, 1994; Rogoff, 1990; Rogoff & Lave, 1984; Wertsch, 1985, 1991; Valsiner, 1989; Winegar & Valsiner, 1992), but then also studied peer interactions, mostly between an expert and a novice (Azmitia, 1988; Gauvain & Rogoff, 1989; Dorval & Gundy, 1990; Tudge, 1989; 1992). As a consequence, many convergent points may be found between the post-Piagetian and post-Vygostkian approaches (Tudge & Rogoff, 1989).

Given the limited scope of this contribution, we shall not however enter into this field of research, restricting ourselves mostly to the post-Piagetian tradition we have been working in for many years. A possible way of gaining a general overview of this very rich domain, is to distinguish two "generations" of research (Perret-Clermont, Perret & Bell, 1991) which show the evolution of this strand. The aim of the first "generation" was to show that social interaction, one of the developmental factors which has been de-

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scribed but neglected by Piaget, was a dimension fundamental to explaining development (Bearison, 1982; Doise & Mugny, 1981; Flieller, 1986; Gilly, 1989a, 1989b; Glachan & Light, 1982; Perret-Clermont, 1979; Mugny, 1985; Roy & Howe, 1990). On an empirical level, a series of experimental studies based on pretest-test – post-test experimental designs was conducted in order to investigate systematically the socio-cognitive conditions which are necessary for individual learning to occur (for a review of these studies, see Azmitia & Perlmutter, 1989; Foot, Morgan & Shute, 1990; Iannaccone, 1992; Taal & Oppenheimer, 1989). One of the conditions which has been described is the presence of a socio-cognitive conflict: children with conflicting perspectives on the definition of the problem are led, under some conditions, to coordinate their perspectives and to construct a more elaborate answer to the problem at hand. Other studies have then focused on the role of social norms, or social marking, liable to provoke a socio-cognitive conflict (Doise & Mu-gny, 1981; Nicolet, 1995; Rijsman, 1988; Roux & Gilly, 1984). The characteristics of this first generation of studies was to compare pretest – post-test performance without paying too much attention to the dynamics of the interaction.

A second "generation" of research departed more radically from the Piagetian theoretical assumptions and considered social interaction not only as a factor, but also as an intrinsic dimension of cognitive development (Perret-Clermont & Nicolet, 1988; Perret-Clermont, 1993; Nicolet, 1995). Assuming that a test or a learning situation is a social situation which has to be actively interpreted by the child (Donaldson, 1978; Light, 1986; Rommetveit,1978, 1992), numerous studies focused on the interactional dynamics which enable a child to enter the adult's or the peer's perspective and create some temporarily shared states of intersubjectivity (Amigues, 1988; Grossen, 1988; Grossen & Perret-Clermont, 1994; Light & Butterworth, 1992; Schubauer-Leoni et al., 1989, 1992; Perret-Clermont, Schubauer-Leoni, & Trognon, 1992; Schubauer-Leoni & Grossen, 1993; Vandenplas-Holper, 1994; Voigt, 1989). This change of perspective led to the hypothesis that the individual benefits observed in the post-tests of the first generation of research might be the outcome of an intersubjective co-construction resulting in a common definition of the situation and task (Light & Perret-Clermont, 1989). Such a perspective converged with the post-Vygotskian strand, since intersubjectivity and socio-cognitive conflict were shown to be interdependent: on the one hand, to discuss a socio-cognitive conflict requires the sharing of some basic states of intersubjectivity regarding the terms of the conflict; on the other, the confrontation of differing perspectives may in turn prompt the partners into entering each other's subjectivity (Grossen, 1994). Furthermore, the very dynamics of a verbal interaction is only possible because the participants do not always share a joint state of intersubjectivity and continually need to reestablish it during the interaction.

However, depending upon their interpersonal relationships, their reciprocal perceptions and expectations, their personal motivations to cooperate and deliver their expertise, participants may be more or less willing to establish states of intersubjectivity (Marková, 1994). In other words, children do not necessarily try to understand their partner's perspective, coordinate each other's points of view and construct states of intersubjectivity. Interpersonal dimensions may thus prevent the children from focusing upon the cognitive dimensions of the task and change the individual outcome following a peer interaction session. Consequently, the question is: what are the interpersonal conditions which enable the partners in an interaction to consider each other's points of view and learn from their interactions?

A few studies have already tackled this issue, exploring interpersonal dimensions such as friendship between children (Dumont, Moss, & Perret-Clermont, 1995; Sorsana, 1994; Azmitia & Montgomery, 1993 in the post-Vygotskian strand) and the perception each partner has of his/her own level of expertise, a point which was shown to change the interactional dynamics with their partners (Butera, 1993).

Verba & Winnykamen (1992) showed that asymmetry linked to a performance in a given task is but only one kind of asymmetry accounting for the interactional dynamics of an expert-novice dyad and that other asymmetries pertaining to the children's status within the institutional school context are liable to change the interactional dynamics. Even though the authors do not make this point, a further (and compatible) interpretation might be that the children's academic status results in reciprocal perceptions of each other's expertise. Social comparison might thus be an underlying dimension related to the interactional dynamics.

Applying the concept of social comparison to the field of cognitive activity, Monteil and his colleagues (Chambres, 1993; Monteil & Castel, 1989; Monteil, 1993) carried out a series of studies concerning the effect of social comparison on high-school students' performance. These results show that the students' achievement depend not only upon the students' competence and/or the characteristics of the task to be carried out, but also upon particular social involvements and the students' experience within the institutional context of the school. According to the author (Monteil, 1993), the students' performance should be interpreted as the result of an interaction between the external characteristics of the context and the students' educational career within the institutional context of the school. This experiment also illustrates the fact that the achievement of a given performance takes place within particular interpersonal relationships which entail the management of the partners' social identities.

Turning to the issue of the role of peer interaction in learning, some general questions might be derived from these studies: what role does social comparison play in the outcome of an interaction session between the children? Are the perceptions children have of their reciprocal level of expertise likely to have an effect on the individual benefits they get from their interactions? What influence do these perceptions have on the children's interactions?

In an attempt to answer these questions, the aim of the present study was to examine the effect of social comparison on the children's individual performance and on the dynamics of their interactions. The general scope was to examine a) whether social comparison would have an effect on the evolution of each child's performance between pretest and post-test; b) whether the evolution between pretest and post-test could be linked to specific interactional dynamics during the interaction session. Concerning the latter point, this contribution only focuses upon three general aspects: the decision-making procedure, the frequency of the children's disagreements, and the frequency of errors.

The manipulation of social comparison was achieved by varying the perception that each child in an expert-novice dyad had of his/her own expertise and that of his/her partner. Dyads which had an actual asymmetry of expertise (e.g. a novice and an expert) were assigned to two experimental conditions: in the first, each child was led to believe that his or her partner had the same level of expertise as him or herself, while in the second, the children could see that their ability to solve the task was different, the novice being less able than the expert. In the first condition, the actual asymmetry of expertise was thus in contradiction with the perceived expertise, while in the second condition, the perceived perception reflected the actual asymmetry of expertise. Of course, a third condition might have been explored, namely a condition in which the novice would perceive him or herself as more able to solve the task than the expert. Since this study was our first experiment on this topic, we decided not to explore the third condition, on the assumption that it is a less common case in everyday school life.

The general hypothesis was that social comparison inducing a perception of equal expertise between the children would provoke more individual benefits after an interaction session than a social comparison inducing an unequal level of expertise. The perceived expertise should also have an effect on the decision-making procedure children would adopt during the interaction (with more decisions being made by the experts than by the novices in the "unequal" condition) and on the frequency of their disagreements (with more disagreements in the "equal" condition).

Method

Overview of the experimental design

The experimental design consisted of four sessions: *Session 1* was an individual pretest aimed at assessing the children's individual performance in order to form the expert – novice dyads. *Session 2* took place a week later and was the occasion on which the independent variable (perception of the expertise) was manipulated. The dyads were told that it was a training session giving each child an opportunity to get familiar with the material and the task. In *session 3* which immediately followed session 2, the children had to carry out a task together as a dyad. *Session 4* was an individual post-test identical to the pretest, assessing the novices' as well as the experts' competence.

Subjects

Fifty-two 7–8 year-old children (26 experts and 26 novices) attending 8 second-grade classes in primary schools in the region of Neuchâtel in Switzerland, participated in the experiment. These children were selected from a larger population composed of 213 subjects (106 boys and 107 girls) on the basis of their performance in the pretest. The novice and the expert of each dyad (13 dyads in each condition) were of the same sex.

Task

The competence tested in this study concerned the mastery of right and left recognition on oneself and on another person or object. The full mastery of this recognition is usually achieved at 6–8 years and is considered, according to Piaget, as a sign that children are able to decenter from their own point of view and take someone else's perspective (see also Ghysselincks-Jansens & Vandenplas-Holper, 1991). Several tests assess the mastery of right and left: the most common in Switzerland and in France is a test called "Piaget-Head" (Galifret-Granjon, 1960) and is made up of three different series of subtests assessing: 1) the left and right recognition on one's own body and on the experimenter's body; 2) the execution of some orders as "put your right hand on your left eye"; 3) the reproduction of some movements represented on a figure.

In the present study, the subtests submitted to the children in sessions 1 and 4 (pretest and post-test) were mostly borrowed from this test, with some additional questions borrowed from Rey (1968) and Dalzon (1990, 1992).

The task to be carried out in sessions 2 and 3 involved the use of a LOGO floor turtle functioning with programmed cards put into a processor. For the purpose of the experiment, only three programmed cards were kept: FORWARD (length = 40 cm), TURN LEFT 90° and TURN RIGHT 90°. Two different paths (one shorter for session 2, the other longer for session 3) consisting of a series of 90° angles were drawn on the floor. The children were requested to guide the turtle without letting it stray from the path. For the choice of a solution, the children had three facsimile cards at their disposal, with the orders FORWARD, TURN LEFT and TURN RIGHT written on them. Children were requested to use them in order to indicate to the experimenter which order should be given to the processor guiding the turtle.

Procedure

Session 1 (individual pretest) consisted of three series of subtests: the first series concerned right and left recognition on the child's own body and on an object oriented in the same direction as the child (0° subtests); the second series concerned right and left recognition when the object forms a 90° angle in relation to the child's body (90° subtests); the third series concerned right and left recognition when the object forms a 180° angle in relation to the child's body (180° subtests). As already mentioned, the aim of session 1 was to determine the children's initial level of expertise. At the end of this session, two groups of children were selected: a) the *novices* who could recognize their right and left on their own body, but not on an object oriented at 90° or 180° in relation to their body; b) the *experts* who had a full mastery of the right and left in the 90° subtests and a good mastery, although not total, in the 180° subtests. Same-sex dyads of an expert and a novice were then constituted for sessions 2 and 3. For the composition of the dyads, the children's socio-economic origin and level of school achievement were controlled.

Session 2 took place a week later and was presented as a preliminary session in which the children would be trained before carrying out the task together in session 3. The children were told they could try the material one after the other before playing together. This session was actually a pretext to manipulate the independent variable: in condition 1 (induction of a perception of an *unequal* level of expertise), the situation was manipulated in such a way that the children's asymmetry of expertise was socially stressed, whereas in condition 2 (induction of a perception of an *equal* level of expertise), the asymmetry was necessarily concealed.

Figure 1a shows the path presented to the dyads of condition 1, the direction of the turtle's movement and the children's position. In condition 1, the novice was first requested to guide the turtle on the path starting from the "top" down to his/her own position. The expert was then requested to bring the turtle back to its starting point. Each time the turtle strayed from the path, the experimenter put a red arrow beside the turn where the error was made. At the end of the training, the children could thus see the number of errors they made. The induction of an asymmetric vs. symmetric perception of expertise was assured by making the task more difficult for the novice than for the expert: consequently the novice made more errors than the expert and the asymmetry of expertise which was assessed in session 1 was made publicly apparent. The children did not give any sign that they perceived a difference in the level of difficulty.

Figure 1b shows the path presented to the dyads of condition 2. In this case, the asymmetry of expertise was concealed by using the following procedure: the expert was first requested to guide the turtle from the "bottom" of the path upwards; then the turtle was placed at the same point of departure and the novice was now requested to guide the turtle. As a result of this manipulation, both children succeeded in carrying out the task without letting the turtle stray from the path and were induced to perceive their respective levels of expertise as being equal.

Session 3 was on the same task as in session 2, except that the path was longer and consisted of 14 turns: – 7 formed a 90° angle in relation to the child's body; these turns will be referred to as "*Easy*" *turns*; – 6 formed a 180° angle in relation to the child's body and will be referred to as "*Difficult*" *turns*; – 1 formed a 0° angle which was included in the path for practical reasons. Between each of these turns, the order FORWARD had to be given to move the turtle forward, but obviously this order presented no difficulty for the children. In total, the path contained 16 orders FORWARD. The children were sitting at a table in order to prevent them from

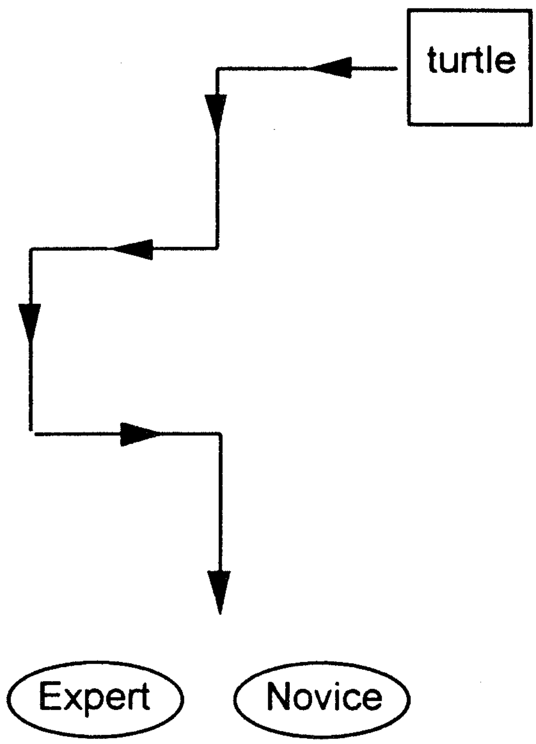

Figure 1a: The path presented to the dyads of condition 1 (induction of a perception of an unequal level of expertise) in session 2

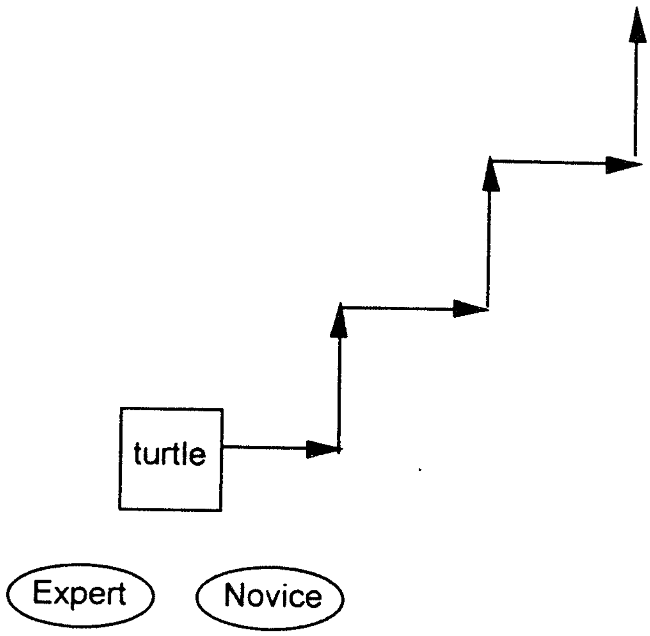

Figure 1b: The path presented to the dyads of condition 2 (induction of a perception of an equal level of expertise) in session 2

orienting their body in the same direction as the turtle. They were requested to reach an agreement on which card to put into the processor and once having reached an agreement to put the facsimile card into a small basket placed in the middle of the table they were sitting at. As in session 2, the errors were indicated by a red arrow put on the ground, so that at the end, the dyad could see the number of errors they made. The path and the position of the children are presented in figure 2.

Session 4 was identical to session 1 and took place a week after session 3. All the novices and the experts were retested.

All sessions were videotaped.

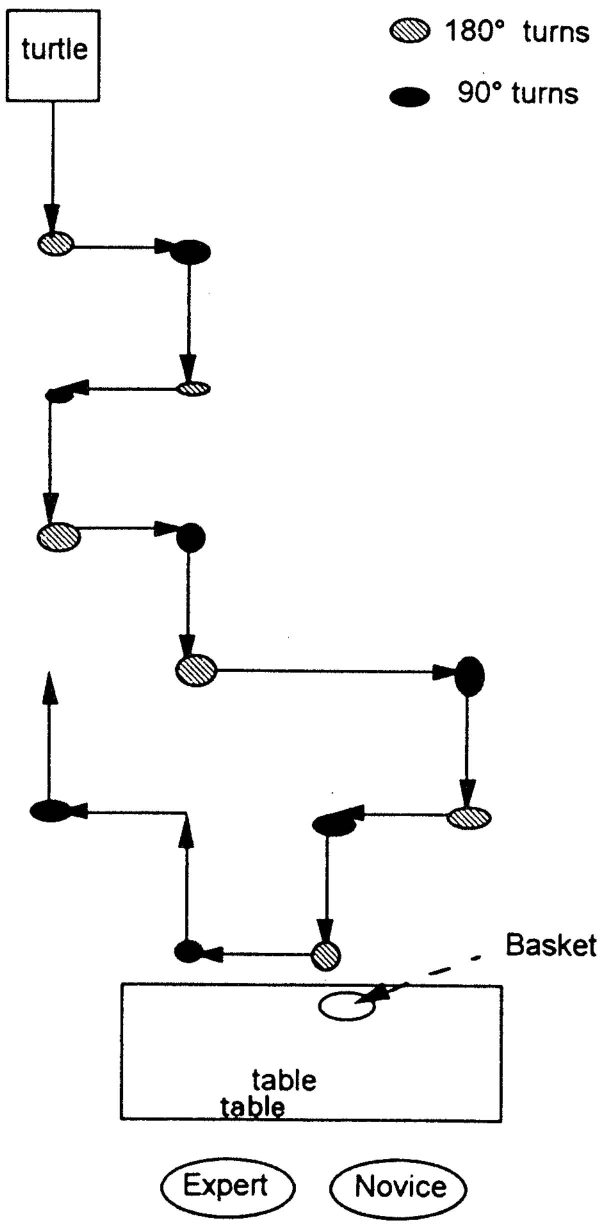

Figure 2: The path presented to the dyads in session 3 (interaction session)

Hypotheses

The *first hypothesis* was that more children would make progress between session 1 and session 4 in condition 2 (equal perception) than in condition 1 (unequal perception). Our assumption was that the induction of an equal perception of the level of expertise should prompt the children to take seriously into account each other's perspectives, to challenge more easily their respective answers and hence promote individual learning. In other words, perceiving another person as sharing some similarities with oneself, should promote both the willingness to enter each other's perspectives and the confidence to challenge the other's point of view.

The *second hypothesis* was that the experimental conditions would have an effect on the decision-making procedure in session 3 (interaction session). We expected the experts to make the decision more frequently in condition 1, while in condition 2, there should be more joint decision making.

The *third hypothesis* was that there would be more disagreements in condition 2 than in condition 1 during the interaction session. Children perceiving their partners' expertise as equal should feel more confident in challenging their partner's point of view.

Finally, we were also interested in the frequency of the errors made by the dyads. Would the experimental conditions affect the collective performance of the dyad?

The analysis of the data will also consider the level of difficulty of the task, bearing in mind that the "easy" turns correspond to the 90° subtests of the pretest and the "difficult" turns to the 180° substests of the pretest.

Statistical instruments

The indicators of the evolution between session 1 and session 4 are the frequency of regressions, stabilities and progressions within each series of subtests (0°, 90°, 180°; other analysis have been carried out on the raw scores obtained in the pretest and in the post-test. The results are similar to those presented here). The level of statistical significance of the results has been assessed by means of the Jonckheere non-parametrical test (Leach, 1979) with an accepted level of significance of .05 (one tie). This test is based on the measure of the coefficient S and is a generalization of the rank sum test for tables containing more than two lines.

The statistical instruments used to measure the interactions between the two independent variables is the coefficient L proposed by Meddis (1984, p. 329). This procedure is sometimes called "non-parametric analysis of variance" and may be applied on ordinal scales and on data for which hypothesis have been formulated (hierarchized groups).

Results

Evolution of the children's performances between the pretest and the post-test

a) Novices

Table 1 presents the frequency of regressions, stabilities and progressions between sessions 1 and 4 by experimental condition within each series of subtests . A "non-parametric analysis of variance" computed on the data shows a main effect of the experimental condition (L = -384; s = 184.48; p = .01), no effect of the level of difficulty of the task (L = -124; s = 150.83; p = .20) and no interaction between the level of difficulty of the task and the experimental conditions (L = 44; s = 150.63; p = .38).

If we examine the effect of the experimental conditions within each level of difficulty of the task as if they were independent experiments, we observe the following results: Within the *0° subtests*, there are twice as many regressions in condition 1 as there are in condition 2. However, the difference between condition 1 and condition 2 is not significant (Jonckheere test: z = .42; p = .33). Regarding the *90° subtests*, the results show that there are twice as many progressions in condition 2 than in condition 1 and that this difference is statistically significant (Jonckheere test: z = 1.85; p = .03). Regarding the 180° subtests, the results show the same difference as for the 90° subtests. However, the difference does not reach the level of statistical significance (Jonckheere test: z = .75; p = .22).

Table 2 presents the frequency of the novices who progressed neither in the 90° subtests, nor in the 180° subtests (no progression: NP), the frequency of the novices who progressed either in the 90° subtests or in the 180° subtests (progression in one series: P) and the frequency of the novices who progressed in both the 90° and 180° subtests (progression in both series: PP).

Table 1: Novices: frequency of regressions, stabilities and progressions by experimental condition within each series of subtests

	Regressions	Stabilities	Progressions	N
		0° subtests		
condition 1	6	2	5	13
condition 2	3	5	5	13
		90° subtests		
condition 1	5	3	5	13
condition 2	1	2	10	13
		180° subtests		
condition 1	4	4	5	13
condition 2	3	2	8	13

Table 2: Frequency of the novices who progressed in none of 90° or 180° subtests (NP), in one of the series (P), or in both series (PP) by experimental condition

	NP	P	PP	N
condition 1	4	8	1	13
condition 2	1	6	6	13

Note: NP: no progression; P: progression either in the 90° subtests or in the 180° subtests; PP: progression in both series of subtests

Table 2 shows that in condition 2 almost half of the novices progressed in the two series of subtests, while only one subject did so in condition 1. In line with our hypothesis, the difference between the experimental conditions is significant (z = 2.01; p = .02).

b) Experts

Since the experts already had the maximum level of expertise for the 0° and 90° subtests in session 1, only the results concerning the 180° subtests are given in Table 3.

Table 3 shows that the distribution is very similar in both conditions and that the difference between the experimental conditions is not significant, contrary to the hypothesis (z = .31; p = .37).

Table 3: Experts: frequency of regressions, stabilities and progressions in the 180° subtests by experimental condition

	Regressions	Stabilities	Progressions	N
condition 1	4	2	7	13
condition 2	4	0	9	13

Analysis of the interaction session and collective performance

a) Decision-making procedures

Three decision-making procedures were defined: *joint decision* (when the children decided together which card should be put into the processor); *expert's decision* (when the expert decided alone without consulting the novice); *novice's decision* (when the novice decided alone).

First we examine whether the novices make the decision in condition 2 more frequently than in condition 1, and then whether there are more joint decisions in condition 2 than in condition 1.

For the analysis of the data, the distribution of the three decision-making procedures in each dyad of the experimental conditions and within each level of difficulty has first been determined. Then, for each dyad, the difference between the frequence of the expert's decision and the novice's decision was computed. This difference (henceforth referred to as D) varies from –7 to + 7; –7 indicates that the novice always made the decision and +7 the case in which the expert always made the decision. Table 4 presents the distribution of the dyads according to this difference (D).

A "non-parametric analysis of variance" calculated on the data presented in Table 4 shows that there is a main effect of the experimental conditions (L = 106; s = 96.19; p = 0.01) (which is in line with the second hypothesis), no main effect of the level of difficulty of the task (L = 49; s = 96.44; p = 0.49) and no significant interaction between these two variables (L = 23; s = 96.44; p = 0.39). Whatever the level of difficulty of the task, the experts made the decision more frequently in condition 1 (induction of a perception of an unequal level of expertise) than in condition 2, and conversly the novices made the decision more frequently in condition 2. However, considering the effect of the experimental condition within each level of difficulty of the task, it turns out that this difference is significant only for the "Difficult turns" ("Easy" turns: z = 1.18; p = .11. "Difficult turns": z = 1.70; p = .04).

Table 5 indicates the frequence of joint decision making in each experimental condition within the level of difficulty of the task. A non-parametric analysis of variance computed on the data shows that there is no experimental condition effect (L = –24; s = 93.33; p = .21), no effect of the level of difficulty of the task (L = 80; s = 93.57; p = .37) and no significant interaction between these two factors (L = 92; s = 93.57; p = 32). Contrary to the hypothesis, joint decision making is no more frequent in condition 2 than in condition 1.

b) Frequency of disagreements

The following situations were defined as a disagreement: a) one of the children suggested a so-

Table 4: Dyads of the interaction session: Frequency of D (number of the expert's decisions – number of the novice's decisions) by experimental condition and level of difficulty of the task

	–7	–6	–5	–4	–3	–2	–1	0	1	2	3	4	5	6	7	N
								"Easy" turns								
Condition 1					1	1	1	2	1	1	2	1		2	12	
Condition 2	1		2			1	1	1	1	1	1	3			1	13
								"Difficult" turns								
Condition 1						1	1	1	0	1	1		3	2		10
Condition 2		1				2	1	2	1	1	4	1				13

For technical reasons, 1 data is missing in condition 1 ("Easy" turns) and three data are missing in condition 1 ("Difficult" turns)

Table 5: Dyads of the interaction session: Frequency of joint decision by experimental condition and level of difficulty of the task

	0	1	2	3	4
			"Easy" turns		
Condition 1 (N=12)	3	3	2	2	2
Condition 2 (N=13)	4	5	2	1	1
			"Difficult" turns		
Condition 1 (N=10)	3	4		1	2
Condition 2 (N=13)	4	4	3	2	

1 data missing in condition 1 "Easy" turns; 3 data missing in condition 1 "Difficult" turns

lution the partner did not agree with, but finally accepted; b) each child suggested a differing solution, the retained solution being discussed or simply accepted by one of the children. Table 6 presents the frequency of the disagreements by experimental conditions within each level of difficulty of the task.

A "non-parametric analysis of variance" computed on the data in Table 6 shows no main effect of the experimental condition (L=-230; s=92.18; p=.07); no effect of the level of difficulty (L=38; s = 92.51; p = .34) and no interaction effect between these two factors (L = -42; s = 92.51; p=.32). Within each level of difficulty of the task, the frequency of disagreements is higher in condition 2 than in condition 1, but in neither case is the difference significant ("Easy" turns: z = 1.08; p = .13; "Difficult" turns: z = .60; p = .27).

c) Frequency of errors in the collective performances

Table 7 presents the number of errors made by the children in the choice of a solution in the interaction session.

Table 7 shows no effect of the experimental condition (L = -52; s = 105.42; p = .31), no effect of the level of difficulty of the task (L=−115; s = 105.42; p = .13) and an interaction effect between these two factors (L = 175; s = 105.42; p = .04). Within the "Easy" turns, there are more errors in condition 1 than in condition 2, while within the "Difficult" turns, the contrary is the case. However in neither case is the difference significant ("Easy" turns: S=−35; z=.84; p=.19; "Difficult" turns: S = 52; z = 1.28; p = .10).

Discussion

The comparison between the children's individual level of expertise in sessions 1 and 4 showed that more novices progressed in condition 2 (induction of a perception of an equal level of expertise) than in condition 1 ("unequal perception"). The induction of a social comparison leading the novices to perceive themselves as being as able as their partner to perform the task had a positive effect on their performance in session 4 (post-test); this positive effect could be observed whatever the series of subtests, but proved to be statistically significant only for the 90° subtests. Concerning the experts, there was no effect of the experimental conditions. This result may be due to a ceiling effect, since the experts already had a high level of performance in the pretest. Our first hypothesis was thus partly confirmed. Perceiving the partner as having an equal expertise as oneself seems thus to be a favorable condition for children to improve their individual performance in the post-test.

Table 6: Dyads of the interaction session: Frequency of disagreements by experimental condition and by level of difficulty of the task

	0	1	2	3	4	N
			"Easy" turns			
Condition 1	3	5	2		1	11*
Condition 2	2	4	3	3	1	13
			"Difficult" turns			
Condition 1	4	3	2	2		11*
Condition 2	1	8	1	3		13

* 2 data missing

Table 7: Dyads of the interaction session: Frequency of the errors by experimental condition and level of difficulty ot the task

	0	1	2	3	4	5	6
				"Easy" turns			
Condition 1	4	4	2	2	1		
Condition 2	6	4	2				1
				"Difficult" turns			
Condition 1	6	3	1		2		1
Condition 2	2	4	2	1	3		1

An analysis of the decision-making procedure during the peer interaction session showed that, in line with the second hypothesis, whatever the level of difficulty of the task, the experts made the decision more frequently in condition 1 than in condition 2. There was however no more joint decision making in condition 2 than in condition 1. The perception of an "equal expertise" has not brought about more "cooperation" in the sense of more "joint decisions".

As regards the frequency of the disagreements arising during the interaction session, the results showed that, contrary to the hypothesis, there were no more disagreements in condition 2 than in condition 1, even though the difference was in the predicted direction. A reason of this unexpected result might be due to our coding of "disagreements". As mentioned before, a disagreement was defined as a differing solution which could either elicit a discussion between the children, or simply be accepted by one of the children. Thus, it might be that only disagreements which are discussed lead to individual learning.

Finally, the analysis of the frequency of errors made by the dyads during the interaction showed that there was no difference between the experimental conditions. The fact that the novices took the decision more frequently in condition 2 was not significantly associated with a higher number of errors, even though there was a tendancy to have more errors in the "difficult" turns.

In conclusion, the results showed that the progress between the pretest and the post-test seemed to be associated with the fact that in condition 2, the novices took the decision more frequently during the interaction session. This result seemed however not be clearly associated with the number of disagreements and the number of errors. What does the fact that novices make the decision more frequently mean for the collective "thinking experience" of both partners? In order to answer this question, a closer look into the dynamics of the interactions is necessary: how do children negotiate their disagreements? How do they deal with the cognitive and social dimensions of the task? How do experts transmit or on the contrary keep their expertise? Preliminary results in this direction will be found in Grossen, Liengme Bessire & Perret-Clermont (in press).

This experiment illustrates that the actual competence of the partners is not the only variable to account for the socio-cognitive dynamics of the dyads and their subsequent individual gains, but that the partners' subjective perceptions of their relative expertise play an important role. It also shows that if we take the expert-novice dyad as a unit of analysis, we cannot merely assume that the expert *is* the expert, namely that he or she has the competence, behaves accordingly to his or her pre-assessed level of performance and is recognized as such by his or her partner. We have instead to consider that expertise is both a competence and a particular social relationship in which the novice and the expert play complementary roles. This finding opens the way to further research at the cross-roads of the post-Piagetian and post-Vygotskian strands: the aim of future studies could be to gain a better insight into the articulation between the definition of the task and the situation, the actual or perceived expertise and the resulting interactional dynamics.

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