

Approaches in the Social Psychology of Learning and Group Work

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Introduction: The nature of the inquiry and the conditions of study

This chapter presents a research strategy which attempts simultaneously to do fundamental and applied work. More specifically it is concerned both with the study of some of the processes at work in educational activities, and also with possible improvements in the methods used to teach children. A project formulated in this way is obviously . . . too ambitious! Indeed, there is a host of factors, as every teacher knows, which maintain or fail to maintain a child's motivation at school and his involvement in learning. Any theory which pretends to be unique and claims the right to dictate educational methods is quite rightly open to suspicion on the part of teachers. Nonetheless we feel that experimental social psychology, because of its methodological and theoretical resources, is capable of making a specific contribution to educational thinking and practice.

Could this contribution consist of practical answers to everyday teaching problems (the usual goal of applied research in education)? Will it enable us to understand what is at stake in the educational situation and thereby clarify and facilitate the teacher's choice of attitudes and methods to adopt? Perhaps. But over and above this we shall try to show that for teachers as well as researchers it is the actual *process* of research which is the *source of understanding* of the educational situation. Becoming aware of the facts and elaborating theoretical interpretations of data are simply steps in this process—just as the choice and development of teaching methods are simply steps in educational practice. It is for this reason that we think it is important to develop *heuristic methods*

which will oblige teachers and researchers to be explicit about and take notice of the presuppositions and representations which influence their thinking and behaviour. These methods should ensure that teachers and researchers check that the educational results which are achieved are indeed those which were intended.

To *understand* may be a goal in itself. And having a better understanding probably enables one to act in a better way. It is perhaps too rationalist, or wishful thinking, to expect understanding to give rise to effective action! Yet the one can be a part of the other. It is not only the well-known "external" factors which constrain educational activities—factors such as cultural, institutional, historical, economic or political conditions. (Indeed it is often wrong to see them as external to the teaching situation). One should remember also that when action is inadequate it is sometimes an indication that one's understanding is too narrowly focussed. At the same time it is likely that, to overcome intellectual shortcomings in the understanding of a difficult educational situation, it is necessary to be actively engaged. And this involvement in turn is only meaningful when it maintains some strict concern for clarity as to the choices which are made. Moreover, in the teaching field, as elsewhere in practical work, these choices are not based primarily on logical grounds but are value choices.

Therefore, it is on the basis of certain social and educational options that our research strategy will investigate both the practices which make those options realizable and also the nature of the obstacles which sometimes prevent one from achieving the intended results. In the work which we present here we adopt a position which shuttles between thought and action, and between plan and realization. Practice poses questions for theory, and theory has to face these questions and to discover its own limitations in the light of practical operationalizations.

Traditionally, so-called "applied" research is distinguished from "fundamental" research by the priority which it chooses to give to the solution of practical problems. The problems with which it is concerned are often those which control the research. "Pure" research on the other hand claims to be free of any constraints which are external to the scientific process. Having no immediate interest in application, it often presents itself as influenced solely by the search for understanding (an end in itself) and by the previous state of knowledge on the particular subject. Following this strict conception of fundamental research the relevance of a question should not be defined in relation to existing social

practice (whether problematic or not), but by reference to the limitations of previously worked-out theoretical frameworks in the particular scientific field. The heuristic fruitfulness of this relative autonomy cannot be denied. But paradoxically its fruits are not only theoretical ones: fundamental research very often has implications for practice.

The dichotomy between fundamental and applied research may be useful in two ways: first, to preserve necessary time for thinking and to keep in-depth research relatively independent of immediate political, social or economic circumstances. And secondly, the distinction also seems useful when it guides choices about how much effort to invest in taking on important concrete problems. But it is artificial when it underestimates the role of the basic understanding which is needed in all applied research; or when it masks the cultural and historical, institutional and political influences on certain fundamental questions.

If the traditional dichotomy is not avoided there will remain a risk that fundamental research will ignore the consequences of its output, whether fortunate or otherwise; and that applied research will waste its breath on concrete answers when, because of a misunderstanding of basics, their long-term interest cannot be assured. For the questions which practice poses are not always based on a correct diagnosis either of the underlying cause of the particular problem or of the level at which solutions should be looked for.

Under the present conditions of applied research in education, while one knows that it is necessary to have a good understanding of the educational context in order to work out answers for it, little energy is invested in giving theoretical shape to this understanding, in giving an account of it, explaining or communicating it. More effort is spent on elaborating techniques and methods than on verifying their relevance. This can perhaps be explained in terms of the operation of the institutions (ministries, research councils, and so on) where the applied research is carried out. They generally have to justify their existence by offering services (consultation, expertise, programme evaluation, and so on) which have to be in the form of concrete answers to particular problems posed by decision-makers (clients, parents, teachers, educational authorities). These quite special circumstances put pressure on researchers to formulate their conclusions, and no doubt leave little time for thinking about the social representations which they set up to guide or even to justify practical actions.

Workers in fundamental research, for their part, are in danger of feel-

ing that they have competitors if practitioners, teachers say, claim to be doing research. But what is striking, from our experience of collaboration between researchers and practitioners, is not the differences in their actual skills due to their professional training. Of course, one has methodological skills and routines of analysis, while the other is skilled in educational and social influence and decision-making. But more striking is the difference in opportunities for intellectual concentration which these two types of professional involvement offer. To carry out a systematic and rigorous piece of research always requires plenty of time and concentration, which the daily educational routine hardly allows. It is difficult, too, and perhaps psychologically impossible, simultaneously to take decisions and to reflect on their basis; let alone to cast doubts on the grounds for taking those decisions. Similarly, it is difficult for the researcher to see what is at stake and to appreciate the practical difficulties in a real-life situation, unless he is introduced to it from the inside by those who are involved in it. It is always much more complex than the picture of it painted by theory.

In terms of these considerations we have been particularly privileged to be able to carry out the research which will be discussed here. We could benefit both from an involvement in university research of a fundamental kind (according to institutional definitions) and also from constant opportunities for collaboration with teachers who were engaged in research to improve their practice. We worked on the basis of options which we both shared. Circumstances allowed us to associate, at one and the same time, with two groups of people: researchers who were trained in experimental methods and took part in the current social scientific discussions in our area; and teachers who had a university training in social psychology and education, and who were engaged, with a certain amount of time at their disposal (under the rubric of continuing education or of applied research), in a conceptualization of their practice and in a search for alternatives. None the less, it is still the case that our own priority was our role as researcher. Our own observations, therefore, are more frequently of a fundamental than an applied type, and the report presented here reflects that imbalance. To avoid it we had hoped to redraft the present contribution with the teachers. But institutional constraints on both sides have unfortunately not allowed us to find the time to do so at present.

The underlying educational questions

Two different types of educational question underlie our work and the interests of the teachers with whom we collaborated.

THE IMPASSE OF THE "COMPENSATORY EDUCATION" MOVEMENT

The source of the very ambiguous term "compensatory education" as we understand it, lies in the finding, which has been established many times by sociologists, of a strong correlation between pupils' social origin and their scholastic success; and, more particularly, in the evidence of massive scholastic failures on the part of children from disadvantaged socio-economic backgrounds. In the face of this finding, which is felt to be a challenge to a certain democratic outlook, politicians, researchers and teachers in the United States and in Europe have tried to formulate an answer, by using educational methods especially designed for children from disadvantaged backgrounds (Little and Smith, 1971; Halsey, 1972). As these experiments evolved, it was found that the educational methods which were used did not give the ambitious results which had been anticipated. A number of their authors were forced to recognize that, in the purely educational formulation of the problem, there was a misunderstanding about the nature of the basic issues involved and about the impact which was possible from educational measures by themselves.

Certainly, to set up a project for compensating social inequalities by educational means, is fundamentally to misunderstand the nature of the factors which contribute to the production of these inequalities (Bernstein, 1973). But does that mean none the less, as one sometimes seems ready to believe, that the school, or educational action, is totally powerless to help the development of children from disadvantaged backgrounds?

A failure of compensatory education has often been reported. But on which grounds is it assessed? One of the aims is to facilitate learning in socially deprived children. Has it really failed to do this? A precise analysis has to be made of the definition of *educational* objectives (not to be confused with the *social* objective of breaking the poverty circle by means of education) and the choice of evaluation procedures and *norms*. We shall limit ourselves here to remarking on the absence of adequate theoretical frameworks for such an undertaking. For it seems to use that

only an approach which succeeded in articulating the different levels of social reality—psychological, sociological, cultural, economic and political—would be capable of allowing one to understand causal processes, to specify modes of educational intervention and to evaluate their impact.

This perspective is, of course, too ambitious. Our modest contribution seeks to articulate a few facets of psycho-socio-educational reality, better to grasp its complexity. By means of experimental paradigms we are attempting to discern the social conditions under which a child assimilates knowledge, and more particularly the psychosocial relations in which he is led to elaborate his means of thinking. When we have tried in this way to identify the social processes at work in cognitive development, we must next attempt to discern to what extent differing social involvement can create different conditions for elaborating knowledge and for relating to knowledge. The door would then be open to formulating and verifying by experiment some more precise hypotheses about the possibilities which the school could grasp of contributing to the development, not only of the children who are generally successful there, but also of the others.

RESEARCH INTO ALTERNATIVES TO EXISTING SOCIAL RELATIONS IN EDUCATION. CAN GROUP WORK BENEFIT CHILDREN'S INTELLECTUAL DEVELOPMENT AS WELL?

Under what conditions can group work prove itself fruitful for pupils' *cognitive* development? This is the second question which underlies the research which we have carried out in Geneva over the past few years, in collaboration with our colleagues W. Doise, G. Mugny, M. L. Schubauer-Leoni and J. Brun. While these experiments have been grafted on to the Geneva school of genetic psychology, they have used the methods of experimental social psychology. In comparing the development of children who have experienced different experimental learning situations we are trying, on the one hand, to elucidate the role of certain social factors in the intellectual development of the child—the role of social interaction between children or between a child and an adult teacher—and, on the other hand, to specify the characteristics of social situations which favour the development of cognitive operations in the child.

In order better to discern the psychological and social mechanisms at

play in children's group work and to appreciate their educational potential, our attention has above all been centred on the analysis of interactions between children and their consequences from the viewpoint of cognitive learning. Too often in our schools the teacher is the only focus of communication. We wish to create educational practices which will decentralize communications in the classroom.

This is not an original idea. Many teachers before now have emphasized the interest of group work. But one can state that with few exceptions (Cecchini *et al.*, 1972, for example) it is the interest of collective activity for the individual's socio-affective development above all which has been demonstrated or called attention to. It is in this sense that Gartner *et al.* (1971), Allen (1976) and other authors have shown the interest of "mutual teaching". In particular they emphasize the benefit which a child in difficulty can get from the chance to be a "tutor" to another child. The progress noticed has been explained in terms of the gratification which the child who assumes the role of teacher might draw from this social interaction. Affective factors are certainly involved in the relation. But to understand the actual *intellectual activity* at play in the partners' exchanges, one must also pay serious attention to the central feature of the task which the children have to accomplish: the intellectual solving of a problem or the learning of a notion. That cognitive activity and its effects should also be specific objects of study.

In quite another context, some time after the Russian revolution, Makarenko (1958) described the life of the colonies of abandoned children which he directed. He often insists on the fundamental role of community for the personality development of the young people whom he sheltered and for the collectivity as a whole. But he scarcely mentions the role of these collective circumstances for the children's intellectual development, even though they certainly had an effect at that level.

More recently, the work of social psychologists with a clinical inclination, notably those who follow Carl Rogers, has shown the therapeutic richness of exchanges in groups, and especially their value for personality growth. Here, and in the teaching profession as well, more or less of a consensus has emerged which recognizes that in certain appropriate conditions of stimulation, joint activities can be of particular significance for the socialization of the individual and for his affective development. But there is rarely any mention of a contingent interest in such group activities for the specifically cognitive development of the child. Does group work only have consequences on the

socio-affective level? Or is it not equally capable of contributing to the child's intellectual development?

It seems that these discussions implicitly treat intellectual work, and *a fortiori* cognitive development, as purely individual activities and processes. They might perhaps be motivated or supported by "forces" of an affective or social origin; but their dynamics and structure are treated as independent of the social conditions under which they emerge. We would hypothesize that this representation of what is involved in pupils' group work is based on a misunderstanding. It puts attempts at organizing such activities in the classroom at risk, whatever the importance and real value is of this type of activity for children's socialization, and whatever is the motive of teachers or parents for promoting it, it is none the less the case that an important and in part specific function of the school is intellectual development and knowledge acquisition. Collective activity seems often, and perhaps wrongly, to be perceived as endangering the adequate accomplishment of this goal in school. The fears which are aroused are worth serious consideration. We should test whether they are well-founded and examine the situations in which they are justified. Here we will comment on some of the more typical representations which we find of the value of collective work and its consequences from the point of view of intellectual learning.

Questions about some current representations of pupils' group work

In discussion with teachers or parents one can detect a suspicion that, while work done in groups sometimes seems superior to individual achievements, any superiority is due to the presence in the group of a more capable member: that member seems to take over the task, lend his competence to it and produce the solution. The other, more passive pupils are simply carried along. It has certainly been shown, in experimental social psychological studies with adults, that for certain tasks individuals do organize themselves in a "centralized" fashion in order to produce an effective solution (see the review of these studies by Moscovici and Paicheler, 1973). But one cannot systematically conclude that the superiority of groups is simply attributable to their having a greater, and statistically predictable, variation of abilities. There are studies (Doise and Mugny, 1975; Mugny and Doise, 1978) which show

that group performance may give rise to a particular structuration which cannot be accounted for simply by the presence of a more capable individual. If in certain cases pupils seem to determine that one of them carries out the supposedly communal task on his own, that does not mean that this is the only relationship in group work. It is pertinent, then, to study the behaviour of children in such situations and to observe the relations between them which emerge, the quality of their performance in joint undertakings, and the learning effects which follow upon those sorts of activity. And in this context one may also ask whether the quality of performance observed is a good indicator of any concomitant learning. Modes of evaluation in schools are often based on this presupposition. We shall have occasion to re-examine it.

There is often a fear that the more passive or weaker pupils will be content with copying their companions' procedures and thus deprive themselves of the chance of learning for themselves. Yet this fear contradicts a concurrent belief that it is essentially by imitation that the child learns. Is not copying simply imitation? Perhaps, then, the fear is that the child will imitate his partner's errors and so achieve "negative learning". In this case, too, we shall try to examine experimentally whether there is a general process at work. Does interaction with a companion who has not mastered the rudiments concerned necessarily end in the learning of "errors"? Or, on the contrary, are relatively more "advanced" children capable of benefitting intellectually from an activity carried out jointly with relatively less advanced children? Collective activity may tend to what is rather brutally called the "lowest common denominator"; or—and this is the opposite fear—it may be of greater benefit to the better pupils.

Another frequent claim is that children from socially disadvantaged backgrounds need more structure work settings than group work can offer them. It is pointed out that progressive education and informal teaching methods have often gained greater support from middle-class families who seem more ready to acknowledge the beneficial effects on their children.

What interest, in fact, can group activities hold for children from diverse social backgrounds? What different roles can the teacher sustain in the light of his pupils' cognitive thinking, and what will their impact be on the children's intellectual formation? Will he limit himself to the role of "activating" the pupils by giving them varied and rich material; or will he also adopt a role of actively joining in the multiplic-

ity of communications and interactions which develop in the classroom? In the latter case, how will he integrate himself into the "horizontal" network of relations between pupils which he would favour?

The majority of these questions and fears are typically formulated by parents and teachers on the basis of their own experience. Very probably they are founded, in part at least, on fact. Group work, in the form in which it is found in our classrooms, is not always profitable to all the children. But the interpretation of the mechanisms at work, it seems to us, are often incorrect. If they were better understood it would make it possible to sort out ways of improving this type of educational practice and to determine its limits.

The evaluation of group work is often global and imprecise. The research review of Muscovici and Paicheler (1973) has already shown this. The value of intellectual activity undertaken together varies as a function of the type of task involved, the network of relations between individuals, the picture which they have of the outcome of their joint activity, and so on. The intellectual dynamics of their interaction depends also on their respective viewpoints on the issue at hand on their ability to co-ordinate their different approaches so as to overcome the conflicts which they will come up against. Conceptual frameworks are necessary to account for the different processes at work in this type of interchange, and the way in which they come together in concrete situations so as to lead to individuals learning or otherwise.

Our research procedure goes through several phases. First, we make explicit a certain number of educational assumptions: for example, that children's intellectual development should be facilitated in school since that is still one of the only places where responsibility is taken for it; that less individualistic, more horizontal and cooperative relations between classmates should be promoted; that one should foresee a relation to knowledge which makes it more than the acquisition of symbols of status or power, and more than a unilateral dependence on pre-established truths in the (vain) hope that simply imitating them might one day lead to their mastery. These educational value choices are made quite explicit before scientific analysis or educational practice begins, even though the latter makes them eventually more explicit and clear.

It is a question, then, of examining the difficulties which are encountered in practice when these objectives are proposed and, in particular, of identifying, as we have just done by means of examples, the *representation* which the various parties have of the nature of these difficulties.

Underlying these representations are hypotheses about the factors which implicitly are involved in the particular educational situation. These hypotheses can be put to the test experimentally, so giving one the opportunity of seeing the representation partly refuted or at least refined. At the same time new possibilities for action emerge. The experimental test is an occasion for the epistemological revision of the models of learning which previously prevailed in practice. It is more conveniently done, and in a more systematic and controlled manner, in the pure setting of the social psychological “laboratory”—though it can sometimes be attempted directly in the classroom (see Schubauer-Leoni and Schubauer, 1979; Schubauer-Leoni, 1979).

In this way new hypotheses are formulated about the expected scope of certain educational activities or certain forms of social interaction. They are then exposed to the realities of the school by using them in the conception of new educational procedures. Sometimes it will be a question of what one might think of as “minor” changes—of attitudes, behaviour or instructions on the teacher’s part. It can also involve more profound changes in the way tasks are conceived of, or how work or relationships are organized. It is then up to the teachers responsible to think of how to set about an approach to educational tasks which fulfils those conditions. Watching what happens is often a harsh reminder that reality is even more complex than one thought in the laboratory where one’s expectations are not always fulfilled. The process turns back on itself, and practice poses new questions for theory, suggests new experiments, new conceptualizations and new assumptions. Little by little they should all gain together, we hope, in efficacy and validity.

A survey of experimental research

Most of the experimental research has been carried out in a typical “psychology laboratory” format, following a very simple paradigm. A supposedly difficult task, but one which is not inaccessible to children of a certain age, is presented to them as a pre-test. In general they are given it individually in a room next to their class (teacher’s room, common room, studio) by two adults, the experimenter and a colleague who takes notes.¹ Subjects’ individual performance in this first task provides information about their level of mastery of the intellectual operations which are involved in the activity required of them. On a second occa-

sion, usually a week later, these same subjects in groups of two or three are called to carry out, this time collectively, a new task, containing the same kind of cognitive difficulties, which they have to overcome jointly in order to solve the task. Finally, after several days, at a post-test, the original task is presented anew to the subject individually. By comparison we can see what progress has resulted from the joint activity. Children in a control group do only the pre-test and post-test.

We will not make a synthesis of the body of our research here, since it is described elsewhere (notably in Doise *et al.*, 1975; Perret-Clermont, 1980; Doise and Mugny, 1981; Perret-Clermont and Schubauer-Leoni, 1982; Perret-Clermont *et al.*, in preparation). We will try to concentrate on disentangling the types of answer which it can give to the educational psychological questions which have been posed.

QUALITY OF INDIVIDUAL AND GROUP PERFORMANCE AND COGNITIVE LEARNING

Can performance in a group be better than that obtained in the individual situation? Indeed, several pieces of research have been able to create conditions of social interaction in which others tend to perform in a cognitively more structured way than when they act in isolation. In the course of three separate experiments, Doise (1973) has shown that judgements (in relation to aesthetic choices, photographs, or professions) made at the end of a group discussion give evidence of stronger organization than judgements made by individuals on their own. Everything happens as if

the group, far from being content with working superficially, that is simply searching for an answer which would create minimal dissatisfaction, really tackles the problem and by arranging the criteria used in a hierarchy manages to base its judgments on decisive choices. (Doise, 1973, p. 136)

Analogous results have been found in research bearing on spatial representation and perspective change (Doise *et al.*, 1975; Mugny and Doise, 1978), and in experiments which elicit the co-ordination of motor activities (Dois and Mugny, 1975). Group activities quite regularly appear to give rise to more elaborate or more adequate performance than when the same subjects are working on their own. But is the group always superior to the individual in this respect?

Moscovici and Paicheler (1973) report a series of experiments with

results which could be considered as contrary instances. In certain circumstances or for certain tasks collective activity is relatively less fruitful than individual activity.

Of course, posing the question as we have gives too global a formulation. As the authors emphasize, an important step has been taken in going beyond the individual-group dichotomy. Instead of trying to establish an absolute superiority of the group over the individual, it is more interesting to examine the occasions on which certain forms of superior performance occur and to try to discern the causes of it by a systematic comparison of the experimental conditions which give rise to different results. It is by following this general procedure that Doise and Mugny (1975) have been able to specify the precise circumstances under which collective performance emerges as superior to individual performance: namely, at the learning stage when subjects are starting to grasp the concepts which are necessary for the solution of the problem which has been set. Indeed, it is only when subjects still have not mastered the cognitive skills which are necessary for completing their task that one can establish that superiority. For when each member of the group has already acquired those skills group performance is no longer found to be superior. In other words, if the child is already capable of carrying out the task by himself, he can hardly do it better in a group. If he is not yet capable, collective activity will probably be superior. The superiority of collective activity appears to depend as well on the social structure of the group (whether or not it is hierarchical) and on the modes of communication between members (whether or not they have recourse to verbal exchanges); and this varies yet again as a function of the type of task and of the familiarity with it which the subjects already have.

From an educational point of view, then, one can now reasonably expect that pupils who are working in a group will only obtain better results when they are still in the process of learning the rudiments of the relevant skills. By contrast when they have mastered them, they only experience group work as a complicating or distracting factor.

If the results obtained from collective activity are sometimes better, to what are they due? In certain cases (Mugny and Doise, 1978) the "stronger" subject imposes his more correct point of view on his partner and in this way makes him the "co-producer" of a more sophisticated answer than he is really capable of. But a series of conditions have also been found in which it is clear that the fact that they are working

together has made the partners give a structure to their procedures (Doise, 1973), to relate them together (Perret-Clermont, 1980a) or to make them more explicit (Schubauer-Leoni and Perret-Clermont, 1980). And this occurs without one being able to see any of the children as being uniquely responsible for what happens: group performance is qualitatively better than the performance of each individual. The conversation in the groups also bears witness to this. Is it possible that it is these exchanges between children who are engaged on the same task that are the source of the thought processes which sometimes lead to a clear superiority in collective performance?

It is interesting to note that sometimes this collective thinking is not immediately fruitful, that is at the time of problem resolution. The gain comes later after some time-lag and manifests itself at the level of individual abilities. In certain circumstances social interaction appears not to enhance the quality of a joint performance. But rather it is the basis for a cognitive co-ordination of different points of view and different actions, which shows itself later on (at the post-test, for example) in the emergence of new competences in the individual. For example, when children have had to share out some fruit-juice equally into a number of glasses of different shapes and sizes, they have not always succeeded in agreeing, or else have stopped with a distribution which in fact was unequal (Perret-Clermont, 1980a). Nevertheless, it can be established that this so-called "failure" in the group situation, where an equal share-out has not been achieved, is still for a number of subjects who took part an opportunity for learning the principle of conservation of quantities of liquid. The learning shows itself later, at the level of the individual, through subjects' progress in the post-tests.

Mugny and Doise (1978) have compared the performance of different types of child dyad on the reconstruction of a model village from different orientations, a task which requires the intellectual operations of spatial transformation. Their research data show that if one simply takes into account the quality of the joint performance one cannot predict on that basis the individual progress to which it gives rise. Indeed, the reason for the quality of group performance varies with the composition of the group. When two subjects who previously had not mastered the operations in question manage to interact and achieve a successful performance, it is because they have been able to co-ordinate their differing and partial points of view to the extent of arriving at an adequate solution. This shared structuration is the basis for learning which man-

ifests itself in higher post-test scores. But when a mixed dyad (that is, one in which one of the subjects has mastered the task and the other has not done so at all) produces a good performance at the time of their interaction, it does not necessarily indicate that the less advanced member has learned anything. The interaction will not have demanded any co-ordination of thinking on his part. The correct viewpoint of his partner will have been imposed from the outset.

In school situations the teacher's attention is often focussed on the *quality* of what the children *produce*, influenced perhaps by the habit of evaluating their work. The research referred to above suggests that the quality of what is produced, in group work in particular, is not necessarily a good indicator of whether this group work has been an opportunity for intellectual learning. Though the experiments do show that, in certain specified circumstances, collective activity can be particularly fruitful for a child's acquisition of new cognitive structures.

WHO LEARNS IN GROUP WORK?

In the last experiment cited we referred to a situation in which the respective levels of the partners in the task are such that neither of them learns anything through their joint endeavours. It is the one who "knows" who is the sole author of the answer. But this may not always be the case. We have observed several situations where it is not. For example:

(1) When the subjects have to make a judgement and do not have the means of verifying the correctness of their viewpoint, by referring to a model answer. When they share the fruit-juice into glasses of unequal size, the advanced child who has mastered the rudiments of conservation of quantities of liquid is not seen by his "less-advanced", non-conserving companion as being right, but as having a different opinion which is not obviously more correct than his own. It has been possible to show, and for conservation of number, length and spatial representation as well, that it is from the *confrontation* between these opposed viewpoints that cognitive progress proceeds, and not from the less advanced child simply adopting the partner's position. Moreover, nothing in the situation suggests to the less-advanced child that he should adopt the other's opinion. If he does so, it will be out of conviction that it is right, at the end of the debate between their two viewpoints. A detailed analysis of subjects' behaviour in fact shows that pre-test non-conser-

vers who become conservers in the post-test offer new arguments in their answers, which are autonomous, intellectual constructions and not simply a repetition or imitation of their partner's.

(2) We have also been able to observe groups of subjects in which no one member is completely a master of the operations required by the task. If at the beginning they have the same centrations (make exactly the same errors of judgement, of transposition, and so on) it is indeed difficult for them to learn something from their interaction. But if their viewpoints are quite inadequate, it is sufficient that they should be different for them to be obliged by their confrontation to restructure mentally in order to overcome the socio-cognitive conflict which divides them. This difference of viewpoint may be related to their different positions *vis-à-vis* the task (as in the village reconstruction test, Mugny and Doise, 1978), or to variation in the partners' respective cognitive levels which gives them a different understanding (Perret-Clermont, 1980a; Mugny *et al.*, 1981). It is in fact quite usual that the children's "mistakes" are not identical. Social interaction makes them aware of the differences and makes them seek to resolve them. In this case one not only sees the less advanced children learn from working with the more advanced, but also the converse! It seems that, in the work of intellectual structuring which characterizes learning, the individual needs to meet opposing points of view in order to have an opportunity to decentre himself from his own position. Whether these other points of view are correct or not, whether they are superior or inferior to his own, appears to be a secondary consideration in the child's final discovery of the logic of a concept.²

(3) In situations in which model behaviour is presented to subjects one can observe the child tending to adopt the behaviour which is proposed. Many researchers have demonstrated this in the context of studies of "social learning", for example. Does that mean that the models must always be of exemplary accuracy, or else the children will learn mistakes? Paradoxically, it seems not. In the short term, indeed, it is probable that subjects will tend to conform to the models offered, whether or not they are correct. One is inviting them to. But in the long term it appears that some progress does originate from the very exercise or work of mental restructuring which is demanded by the attempt to adopt the model behaviour. Thus, Levy (1981) is showing that subjects to whom she has presented incorrect models in spatial representation tasks subsequently produce correct solutions for themselves and at a

superior level to those which they produced previously. It is probable that it is not so much an attempt at imitation which stimulates the subject's mental restructuring, as the confrontation of his own behaviour which is different. This seems to be confirmed by recent research on the conservation of quantity in the sharing of fruit-juice (Perret-Clermont and Schubauer-Leoni, 1982). We compared the effects of different opportunities for learning—the presentation of a model (a correct one in this experiment) and interaction with a conserving peer. We observed that the subjects made progress in both situations, as predicted. But in every case where they were children from socially disadvantaged backgrounds the learning which was effected through confrontation with a peer was more “autonomous” than that which was engendered by having an adult present a model answer. When the task is presented, subsequent to interaction with a peer, the subjects answer questions in quite an advanced manner, whatever the context in which the task is set. Following the presentation of a model answer, on the other hand, although when the test is given to them in a context analogous to the learning situation (that is, the child has to divide the fruit-juice between himself and the adult experimenter) they answer quite adequately, when the interpersonal context is changed and they are asked to share the same juice between glasses belonging to two dolls rather than to themselves and the experimenter, they perform less well. In this model imitation-learning situation it is as though, to borrow an expression of Païn (1981) to describe an analogous clinical phenomenon, “the learning belongs to the relation” established between the experimenter and the child.

From an educational perspective, then, it is essential that the child should have opportunities for intellectual exchange around the concepts which he must learn to master. It is not so much the accuracy of the propositions which he has contact with that matters, as the very fact of confronting them in a situation in which the task which he has to solve makes him overcome any contradictions which he meets. Whether it is in the course of interaction with adult or child, more or less advanced than himself, it is the need to resolve socio-cognitive conflicts which seems to be the source of cognitive progress. These socio-cognitive conflicts can be aroused by very different circumstances: joint work with a partner at the same cognitive level but with a different viewpoint, or with a partner at a different cognitive level but without clear conscience of it, and so on.

In the course of analysing the pre-test results in several of the research studies referred to here (Perret-Clermont, 1976, 1980a; Mugny *et al.*, 1977; Perret-Clermont and Schubauer-Leoni, 1982) we have been able to verify the frequent claim that children from socially advantaged backgrounds tend to be more advanced on cognitive tests than those from disadvantaged backgrounds. Does this mean that the latter are handicapped in terms of their learning potentialities? At the cultural level it is clear that certain facilities and a certain proximity to sources of knowledge help the child's learning. In particular, he will have readier access to information and the necessary time and material resources. Above all, perhaps, he will have at his disposal people who are interested in facing up to and discussing his preoccupations, who even value the intellectual activity which that demands and who can take the social and emotional risks involved.

However, one must not confuse "social" and "psychological" handicaps in the context of learning and "socio-cultural" ones, whose nature has never been clear. This is a confusion which unhappily has encroached upon several discussions of compensatory education. (It is supposed that one compensates a defect in the individual, which in the last resort becomes a psychological defect for which "re-education" is needed.)

In the research cited above, not only have the relative abilities of subjects from different backgrounds been examined in the course of the pre-tests, but also their capacity for learning during the period of experimental social interaction. It has been systematically found, and in quite different environments and areas (in Suisse romande, but also in Ticino and in Spain), that while the initial, pre-test performances reflect social inequalities, the possibilities for learning of children from disadvantaged backgrounds are quite comparable or sometimes even greater. With the children of four to nine years whom we have studied and in the very precise experimental conditions, it is often enough that they be given an opportunity for adequate confrontation with another (even a brief one, of some ten minutes) for the general level of their post-test results to be in every respect comparable or superior to those of advantaged children's pre-test performances.

This encouraging finding suggests that children's social handicap is not a psychological handicap affecting their ability to learn. But one

must not generalize too hastily. Further investigations are called for. The results should be verified for all age-groups. The opportunities for learning which are missing for social reasons, cumulative retardation in school and a lack of incentives for cognitive restructuring probably have long-term psychological consequences. But one should not underestimate, either, the possibilities for adaptation and restructuring which individuals of widely different ages can demonstrate.

It is obvious that social conditions of poverty have consequences for the child's physical development (through inadequate diet, illness, and so on) and that this in turn has consequences for psychological development which depends on it to some extent. Though, again, do we know the organism's capacity for recuperation when he is offered proper opportunities?

With the limits of these factors, however, it appears that when educational action succeeds in creating conditions which are both socially and intellectually adequate it can have a major impact on the development of every pupil, whatever may be his social background.

We have exhausted here neither the mass of experimental research conducted in the domain of cognitive learning and group work nor the body of educational preoccupations. But enough has been said to relate it to practical, everyday situations in the classroom.

Practical research at the level of classroom teaching

We will now turn to some research carried out by teachers in the context of their own day-to-day practice in the classroom. Their aim is, at one and the same time, to improve their educational methods in group work and to observe whether the effects expected do emerge, and to confirm or disconfirm hypotheses as to the processes involved which have been disentangled by experimental laboratory research.

As an example we will refer to an experiment by J. C. Husson-Charlet. He teaches technical drawing to adolescents who are in professional training. He has been observing his pupils carry out in groups the tasks which he sets them: for example, the schematization of a fishing-reel. We have described the project in a little more detail elsewhere (Perret-Clermont, 1980b). Here we will limit ourselves to considering how his observations enlighten the processes at work and helps us understand the educational difficulties.

Different groups do not perform in the same way. They vary in their mode of spontaneously organizing themselves, in the role given to leaders (who are not always the usual leaders, but often pupils recognized as the "most advanced" in the class), and so on. The richness of what is produced is directly linked, it seems, to the group's mode of organizing its work. But in this experiment there is one factor which had not been taken sufficiently into account by previous theory and which appears to be more important than all the others: that is the unfortunate effect on the pupils of seeing their activity as school work. When these pupils find themselves faced with a school exercise, they seem to behave as if their main objective is simply to ensure that they rid themselves of the task as effectively as possible! They seem to organize themselves within the group in such a way as to ensure that the pupil who has the reputation of being "most skilled" carries out the task on his own and as quickly as possible so that everyone can get it out of the way. On the other hand, when these same adolescents are willing to get involved in an "intriguing task" which they must solve, independently of any academic constraints, then the socio-cognitive confrontations are dominant in the group. The relative academic status of different members of the group seems no longer to play the same role. The educational paradox, then, is to find intriguing tasks and to manage to present them to the pupils within the school setting as external to the academic game. This paradox will only be resolved under special circumstances. J. C. Husson-Charlet, while strongly attached to defeating this paradox, is of course always in danger of running out of steam. For as a method is repeated it becomes the (academic) norm and the pupils return to their ingenious practices. They no longer solve the problems set them collectively; but they present a solid front and organize themselves for the optimum immediate academic output (to accomplish the tasks, obtain satisfactory marks, and so on). They do this even though, whether knowingly or not, they thereby bypass opportunities for learning which (perhaps?) would bring them a higher return in the long run.

The educational challenge is to find a mode of organizing academic work which obliges the pupils to co-ordinate their viewpoints or to consult together and reach an agreement. So, for example, J. C. Husson-Charlet asked his pupils to work in groups of three and make drawings of the same object. Each pupil was to make his own sketch, but with the proviso that "each pupil's drawing will receive a mark which is the

mean of the marks given to the drawings of the three members of his group". Under these conditions he did find that the pupils interacted and experienced socio-cognitive conflicts. The contract obliged them to consult together because the incidence of errors in a comparison's drawing was damaging for his group-mates. At the same time it was necessary that they engage in the consultation with conviction. It was no good them operating a system of phoney corrections, since this would multiply their mistakes and penalties.

At a technical level this solution seems to be a happy one in its educational outcomes. But in the context of school, pupils are not used to such joint endeavour and solidarity. Sometimes they see it as tiresome and unnecessary. With friendly irony and all due respect to their teacher whom they appreciate, they openly suggest that this method is "an educational curiosity which the teacher is interested in"! They do not seem to share the interest. They feel somehow trapped in the intellectual and social effort required of them. Somehow this effort is quite unusual for them. Most of them have undergone a school career as "bad students" and with a series of failures. They have learned that they are of "poor intelligence" and that it is no use investing their energies in learning and thinking.

These students' past, and the limited ambition of the school towards them, sets strong limitations upon Husson-Charlet's project. He was faced with the following question: can one oblige someone to learn, supposing he is capable of it, when he does not see the point of it?

"To oblige someone to learn" seems to be profoundly contradictory to the psychological dynamics of learning. They originate in the subject's interactions with people around him. Lévy's (1981) research results in the laboratory suggest that if an individual restructures his point of view when he is in socio-cognitive conflict with someone, he does it in particular to maintain his relation with that person. In educational terms that perhaps means that if a pupil learns it is particularly because he had a relation (of trust?) with the teacher, which he values and strives to maintain.

Another difficulty is to select tasks for which collective work has the predicted advantages. In order to choose them, one must know in detail what cognitive difficulties technical drawing exercises can present and what obstacles the pupils must learn to overcome. Although teachers may recognize pupils' common learning difficulties, they do not always

know how to avoid them. Psychologists do not seem yet to have studied precisely those cognitive processes which are involved in tasks of this kind.

This is a general remark. In most of the previously cited experimental research, the concepts which have been studied (conservation of quantity, spatial representation, and so on) do not directly concern the material which forms the substance of school teaching—mathematics, languages, science, drawing, etc. Are the psychological processes of learning similar in these different domains?

These practical considerations have led us to make a similar experimental study of those notions which schools have a duty to teach or engender. Brun (1979) has already shown that mathematics learning cannot be solely explained in terms of a child's operational development. Are the social interactions which seem to play an important part in the development of operational concepts at work in an analogous fashion when the pupil acquires mathematical concepts? It will be a complex business to answer this question. There seem to be different kinds of development simultaneously involved (operator, symbolic, semantic, etc.) relying perhaps on one another but not being reducible to one another (Schubauer-Leoni and Perret-Clermont, 1980; Perret-Clermont *et al.*, in preparation).

New perspectives on experimental investigations

We have just referred to an educational experiment which seems to illustrate well the general purpose of our research. In the light of certain educational preoccupations (in the field) thinking has been elaborated (in the laboratory) which can to a certain extent enrich educational practice. It has suggested modes of group work, drawn attention to the intellectual objective of such activities, allowed the teacher to explore new educative relations with his pupils, and all that with some success academically for the pupils. However, some problems remain. They demand a deeper understanding of certain relevant psychological issues. The adolescents who are believed to be non-academic confirm their image by their fear of becoming involved in academic tasks. It is a though it is enough for them to see their tasks as school work for them to lose interest in them or not even see their intellectual function. Under what conditions will the individual try to overcome the socio-cognitive

conflicts which he comes up against? To what extent can the teacher structure the cognitive path down which he wishes to lead his pupils? What knowledge has he at his disposal about the nature of the learning which he is trying to stimulate and about the specific obstacles in the subjects he teaches which he would have his pupils surmount? Till now psychology and applied psychology have scarcely tackled these questions.

Other teaching experiments have proved encouraging, while promoting a variety of relational modes in the classroom—mutual teaching, independent small group projects, cooperation among schoolmates, and so on. But difficulties arise when the processes at work are not clear to the teachers. Perret (1978), for example, was, as an educational psychologist, associated with the work of a team of teachers who were trying to make high school students work in small groups on projects in different disciplines. He was led to conclude that here, even more than when it is implicit because the ways of working are “traditional”, if the activity is to be successful, each pupil must clearly understand the purpose of the exercise [the task(s) to be done, the learning to be accomplished, what information to collect, what structuring to carry through, the time to invest, the mode in which evaluation will be carried out]. The teacher’s instructions must be even more explicit than usual because they are no longer the only guides to the pupils. But being sufficiently explicit is not easy. It appears that pupils from socio-culturally advantaged backgrounds have more readily understood the purpose of such activities. This and other issues could be taken up in more specific experimental studies of the conditions of effective communication.

By way of conclusion

The reader who has followed us this far is no doubt waiting to see how we conclude our argument and is expecting us to underline the fact that psychologists know practically nothing about school learning and that there are many more questions than answers. This could be a conclusion with a pessimistic note. In fact, in our optimism we are glad that so many questions can now be more precisely posed.

We are in a period when the educational hopes of 1965–75 seem to be vanishing like former dreams. The teaching profession is becoming

increasingly anxious at the growing complexity and technical nature of the disciplines which they teach. There is a serious danger that our school systems will feel disabused and will retreat into immobility.

Our argument has tried to show that it is not enough simply to extol alternative educational practices for them to bear the predicted fruit, however good the ideological or scientific reasons for doing so may have appeared! If educational work wishes to attain its goal, it must be much more precise and rigorous; and for that an infrastructure of research is required (with adequate availability of time, qualified teachers, interested social science researchers and adequate methodological instruments). This research must not be seen as a substitute for the practical experience which the teaching profession accumulates. It should work along with it, be complementary, questioning it and making it explicit. Research can elaborate conceptual frameworks for unravelling practical situations, helping to perceive the actual choices, and calling attention to possible alternatives.

These educational choices are in the first instance value choices, social choices. No doubt they require negotiations between the interested parties. But does one always know what can be chosen, what may be the alternatives? Even if the major options are clear, and even if the necessary political will is present, this is not enough to ensure that they will be realized. One must be aware of the means (educational, relational, institutional) by which they might be put into practice. If the educational practices which are adopted are to be more than ideological concessions, their predicted effects must be monitored and verified. To do that one must pose adequate questions in order to have to answer them. These answers are arrived at through a tentative research procedure which relates simultaneously on the political will to understand and to succeed, on collaboration between researchers and practitioners, and on an understanding by the relevant professional and social powers of what is at stake.

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Notes

1. As far as possible we have tried to make these adults uninhibited by having them introduced to the pupils by the teacher as people who want to play games with them in order to understand better how children think, what problems they find difficult, and why. Despite these precautions the majority of subjects, at least at the beginning of the experiment, probably experience the situation as an examination conducted by two strangers. But they are generally confident and lend themselves willingly to the exercise.
2. It is clear that the concepts envisaged here are of a logico-mathematical kind, in the Piagetian sense: concepts of conservation of number, physical quantities, spatial transformation. This type of process may also apply in the learning of rules (grammar, moral judgement, and so on). But is it clear that notions which are more arbitrary, conventional or culturally bound must be exhaustively and correctly presented if they are to be learnt?

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