

Hypothesis 7 tested the speculation that ability indices are more stable when only items which fit the model are considered. In considering a similar hypothesis, Anderson *et al* (1968) adopted the procedure of recalculating ability indices after eliminating items rejected by both samples. In the present data, only eight items were in this category. After recalculating indices for the 85 remaining items, the correlation between indices was  $r = 0.9906$ .

#### CONCLUSION

The Rasch model is a simple model which takes no account of item discrimination or guessing. It claims to estimate item easiness independently of the ability of the calibrating sample, and to estimate the ability of persons independently of the items used. Implicitly, the model assumes the unidimensionality of items, that guessing is minimal, and that item discriminations are high and uniform. A review of empirical literature, however, suggested that the model was robust with respect to departures from these assumptions. The greatest problem with the model was the number and nature of item rejections, but the goodness of fit test seemed to be only an approximation, sensitive to sample size. Most importantly, however, ability indices were stably calibrated regardless of item fit to the model. This suggested that person ability may be stably estimated even when the items involved are of mediocre quality.

A test of 93 items was constructed by a panel of experienced teachers to assess a loosely defined latent trait. Items were chosen on the basis of face validity rather than on item quality. The test was administered to two large independent samples of secondary school pupils. Seven hypotheses relating to parameter estimation and fit to the model were tested.

Item easiness indices were calibrated stably across groups. Extreme skew in the ability of calibrating samples produced a marginal, but

THE OPEN EDUCATION DEBATE: A RE-DEFINITION OF THE ISSUES

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Concepts such as "open education" and "traditional education" are no longer useful to educational theorists, researchers and practitioners. This view is held for two reasons. First, there are so many overlapping definitions applied to each term that communication is impossible without exhaustive discussion and a clear understanding as to which definition is being used. Secondly, the emotional connotations that have become attached to each of these two concepts impede not only an analysis of the issues raised by the open-traditional education debate, but also the use of empirical evidence to help resolve the controversy. Indeed, one philosopher of education has called the term "open education", "a powerful and non-specific slogan" (Hill, 1975, p. 3). Educational researchers, in their attempts to avoid these definitional problems, have employed concepts such as "open area" classrooms in order to refer to architectural as distinct from openness in the educational programme (e.g., Angus, Evans and Parkin, 1975; Allen, 1976; Traub, Weiss and Fisher, 1974), "informal teaching styles" (Bennett, 1976), and "degree of classroom structure" (Smith, 1977).

A promising analysis of different forms of educational practice has been undertaken by Bernstein (1975), who made a distinction between a "visible pedagogy" and an "invisible pedagogy". This distinction offers the educational researcher a number of testable hypotheses based on the sociological theory of social control. Because the visible-invisible pedagogy distinction is not widely known, an extended discussion of the invisible pedagogy's characteristics, assumptions and educational consequences will be undertaken, followed by an outline of the supporting evidence for the distinction. In Part II of this paper, an examination of methodological issues involved in conducting and evaluating research

in the classroom environment field will be made.

Part I: The Visible-Invisible Pedagogy Distinction

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An invisible pedagogy has the following characteristics:

1. the teacher's control over the child is implicit rather than explicit;
2. the teacher arranges the context which the child is expected to re-arrange and explore;
3. the child apparently has wide powers over what he selects, over how he structures, and over the time scale of his activities;
4. the child apparently regulates his own movements and social relationships;
5. there is reduced emphasis upon the transmission and acquisition of specific skills; and
6. the criteria for evaluating the pedagogy are multiple and diffuse and so not easily measured.

According to Bernstein, the basic difference between visible and invisible<sup>1</sup> pedagogies is in the manner in which rules are transmitted and in the degree of specificity of the rules. The more implicit the manner of transmission and the more diffuse the rules the more invisible the pedagogy; the more specific the rules, the more explicit the manner of their transmission, the more visible the pedagogy. In the invisible pedagogy, the teacher becomes the "facilitator" or "enabler" and rules become "guidelines". The first performance guideline for the child in the invisible pedagogy is to ask a question: the child is assumed to be an initiator of activities rather than a passive recipient of knowledge.

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1. This author prefers the terms "explicit" and "implicit", because of the possible misinterpretation of the concept "invisible pedagogy" as meaning that the teacher's rules/guidelines are not capable of being understood by the child.

The first performance guideline for the teacher who adopts an invisible pedagogy is to answer the question frankly, honestly, clearly, without giving the information directly: the teacher's aim is to provoke continued inquiry into the matter by the child.

Play is the concept which is basic to the invisible pedagogy. In the classroom in which an invisible pedagogy is employed, no distinction is made between work and play. As the famous British early childhood educator, Susan Isaacs said, "play is the work of children" (1932, p. 9). Bernstein argues that in this fusion of play and work lies the class origins of the invisible pedagogy. For the working class, work and play are very clearly separated, whilst for certain sections of the middle class the distinction becomes blurred. Work, for these members involves "intrinsic" satisfactions (cf., Inkeles, 1960). Other class assumptions of the invisible pedagogy will be discussed later.

#### Learning Theory Underlying Invisible Pedagogies

Bernstein outlines five features of a theory of learning underlying invisible pedagogies:

1. The theory is developmental and concerned with sequence. A particular context of learning is only of interest in as much as it throws light on a sequence in the child's development;
2. Learning is a tacit, invisible act, its progression is not facilitated by explicit, public control;
3. The theory will tend to abstract the child's personal biography and local context from his cultural biography and institutional context;
4. The theory sees socialisers as potentially, if not actually dangerous, as they embody an adult-focussed concept of the child; and
5. The theory is seen as an interruptor of cultural reproduction and therefore has been considered by some as progressive or even revolutionary (Bernstein, 1975, p. 4).

According to Bernstein, the learning theories of Piaget, Freud, Chomsky, ethology and Gestalt satisfy all of these features, with the exception that Gestalt theory is not developmental. While these theories contain their differences, at this level of abstraction they are all consistent. On the other hand, learning theories which emphasise cultural transmission and external reinforcement would presumably underly visible pedagogies. In the learning theory of the invisible pedagogy, "notions of child's time replace notions of adult's time, notion of child's space replace notions of adult's space; facilitation replaces imposition and accommodation replaces domination" (Bernstein, 1975, p. 5).

#### Class Assumptions of Invisible Pedagogy

Bernstein argues that the invisible pedagogy contains at least four social class assumptions:

1. It presupposes a middle class conception of time;
  2. It presupposes an elaborated code of communication;
  3. It presupposes a middle class mother who is an agent of cultural reproduction; and
  4. It presupposes a small class of pupils.
1. The middle class conception of time is that of an extended period of formal education, which the middle class can afford to give its children. This assumption allows the invisible pedagogy to practice individual pacing of learning, the integrated day and postponement of skill training in the three Rs.
  2. The distinction between an elaborated and a restricted code of communication was postulated by Bernstein in the early sixties (Bernstein, 1961). Briefly, it refers to language which varies in the degree to which it is context-bound: the more context bound the language the more restricted is its communication function. The invisible pedagogy of the home and school orientates the child early towards the significance of

relatively context-independent meanings, whether these are in the form of speech or of writing.

3. Bernstein (1971) has also distinguished between person-oriented and position-oriented families. In the person-oriented family the child is valued for his own sake not because of his position or status as a child. Consequently, his opinions, statements and suggestions will be received as those of a contributing member of a family unit and not devalued because of his age or inferior status in a power-based relationship. The person-oriented family changes the role of the mother from that of domestic administrator to one of cultural reproducer. The mother, through her constant interaction with her children, becomes a crucial agent of cultural reproduction of a person-orientation. Where there is a contradiction with her role as a mother and her occupational role, these tensions may be partly resolved by placing the child early in a pre-school which adopts a similar, person-oriented approach.

4. The final assumption of invisible pedagogies is the smallness of the class class size of pupils and the favourable teacher-pupil ratio. Again, invisible pedagogies are expensive and therefore are available to those who can afford them.

#### Consequences of Invisible Pedagogy

The shift from visible to invisible pedagogies at the pre-school and, in some cases, the primary school changes the relationships between the family and the school. As was claimed earlier, the middle class mother with a person-orientation influences the pre-school and infant teacher to adopt a similar approach to her child. When the child moves up the formal education system, however, the public examination system imposes changes on the secondary school. The public examination system is based on a visible pedagogy of strict rules, set textbooks, and limited time scales.

If access to visible pedagogy is delayed too long, the parents worry that their child's examination success may be endangered. Middle class parents usually resolve this contradiction by encouraging an invisible pedagogy in the primary years but insist on a visible pedagogy in secondary school. This practice is adopted both in the private school sector as well as the public school system. 439

In the case of the working class, however, the shift from home to school is more radical, according to Bernstein. The invisible pedagogy of the school potentially makes possible the inclusion of the culture of the family. Thus the experience of the child and his every-day world could be psychologically active in the classroom and, if this were the case, then the school would legitimise rather than reject the class-culture of the family. As long as the pacing of the learning is relaxed, then the progression is less affected by middle class assumptions. In the case of visible pedagogies early reading and writing is essential. Once the child can read and write this enables the teacher to make use of the textbook - a prime means of transmitting knowledge according to explicit rules and procedures. "The textbook orders knowledge according to an explicit progression, it provides explicit criteria, it removes uncertainties and announces hierarchy" (Bernstein, 1975, p. 13). From the working class parent's viewpoint, the visible pedagogy's early emphasis upon the basic skills of reading, writing and arithmetic is immediately understandable. The failures of the children are seen as the children's problem, not the school's fault, because the school is apparently carrying out its assigned function. The theory of the invisible pedagogy, however, may be unknown to the mother or be imperfectly understood. There is a discontinuity between the social control of the home and that of school: explicit rules of acceptable behaviour are replaced by implicit guidelines which the child may have difficulty in comprehending. From the teacher's perspective, the informal teaching methods and values of the parents may be seen as irrelevant

or even harmful to the child's adjustment in the classroom. The child's failures may be attributed to the home together with the plea, "If only we could make them better parents." The conclusion reached by Bernstein is that, while the invisible pedagogy is potentially beneficial for the working class child, its potential may not be realised by a lack of communication of its expectations to both the child and the family.

#### Evidence for the Invisible - Visible Pedagogies Distinction

It is one thing to articulate a distinction between invisible and visible pedagogies, it is quite another to ascertain whether there is any empirical basis for such a distinction. Bernstein himself does not provide any evidence since that was not the purpose of his paper. Its aims were merely to provide an analysis of current forms of educational practice as forms of social control and to examine the social class assumptions underlying them. It is incumbent upon educational researchers to seek out evidence where it already exists or to design research studies in order to produce the necessary evidence if we are to learn whether the distinction is useful in understanding the complex processes of education.

It is possible to point to at least four sources of empirical evidence which give support, albeit indirect support, to Bernstein's distinction between invisible and visible pedagogies. The evidence is indirect because the distinction is a relatively recent one and the research which supports it was carried out either before it was put forward, or independently of the distinction. Nevertheless, the four pieces of empirical evidence suggest that the distinction between invisible and visible pedagogies is a promising one.

The first source of empirical evidence for the distinction comes from a large-scale study of 39 Ontario, Canada, primary schools which varied in both architectural and educational programme openness (Traub, Weiss and

Fisher, 1974). A factor analysis of the teachers' responses to a questionnaire asking them about the degree of programme openness revealed the following six factors: individualisation of instruction, student independence, environmental flexibility, nongradedness, flexibility of student evaluation and flexibility of curricular materials. These clusters of items bear a striking resemblance to the characteristics of the invisible pedagogy, as outlined at the beginning of this paper. It was found that eleven-year-old children attending Type I schools (i.e., 15% or less of the pupils came from homes where English is the second language) performed just as well on tests of cognitive achievement when placed in architecturally open, mixed or closed schools and irrespective of whether the educational programme was more or less open. The authors conclude that "the students in these schools seem to learn in spite of the system" (Traub, Weiss and Fisher, 1974, p. 57). It should be noted that the populations attending Type I school were from largely middle-class homes. The pupils in Type II schools (i.e., 30% or more of the pupils came from homes where English is the second language) performed differently according to the degree of programme openness. The achievement test results consistently favoured those schools with less open programmes. The populations of these schools came from inner-city, working class homes. While the authors of this research study are careful not to impute a causal relationship between social class and degree of educational openness, the fact that a consistent relationship was found in such a large-scale study with several independent measures of cognitive achievement makes further research in this area necessary.

The second piece of supporting evidence for the invisible-visible pedagogies distinction is derived from a longitudinal investigation of two groups of children during the first six years of their life (White and Watts, 1973). The sample of children were classified as either Group A or Group C according to the level of social and non-social (i.e., intellectual) competence. Examination of their early home experiences revealed that the

most competent children (Group A) came from homes where the mother provided many opportunities for the children to explore their environment and to create (e.g., they were not overly concerned with the tidiness of the home when it conflicted with the painting and other activities of the child). Further analysis showed that many more of the Group A (most competent) children came from middle class homes than working class homes and, conversely many more of the Group C (least competent) children were from working class backgrounds. Related evidence of the existence, in the home, of invisible and visible pedagogies which are related, though not without exceptions, to social class is seen in the research of Hess and Shipman (1965), Strodtbeck ("the hidden curriculum of the middle class home," (1966), Bee et al (1969) and Feshbach (1973).

The third study of interest in illuminating the distinction is a piece of research carried out to ascertain the home background of pupils who had adjusted well or poorly to a classroom environment which could be described as having an invisible pedagogy (Groundwater-Smith, 1976). The researcher conducted interviews with the parents of the children who had been selected by their teacher as being well adjusted or poorly adjusted to the classroom environment. The interviewer did not know in advance to which group the child belonged. In addition, a test of person vs position orientation (see definition of this distinction on p.5 ) was administered to the children. It was found that both the parents and the children who were classified as poorly adjusted to the invisible pedagogy possessed a position-orientation. The parents were concerned with relationships based on authority and status, had firm rules about acceptable behaviour for their children, and expectations that the school would provide their children with the skills necessary for occupational success. The children indicated that they had internalised these values. No analysis of the social class background of the two groups of children was undertaken but the fact that the school draws its population from a predominately middle-class area suggests

that within the middle class there are differences in person and position orientations that may lead to discontinuity between the pedagogies of the home and school. 441

The final source of empirical evidence in support of the invisible-visible pedagogy distinction is derived from a study carried out by the author in which the relationship between the degree of classroom structure and affective pupil characteristics was investigated. Classroom structure was defined as "the availability of cues within the whole that give certainty of meaning, definiteness of form, or clearly understood expectations" after Grimes and Allinsmith, 1961, p. 300). It can be seen that this definition follows closely that of a visible pedagogy. Briefly, the major finding of this research project was that the degree of classroom structure was related to the level of self-concept of the pupils. In other words, the more highly structured the classroom environment, the more favourable were the pupils' self-concepts. It was argued that explicit expectations on the part of the teacher were related to higher levels of feelings of self-worth, not only as to one's ability in school-related activities but also more generally to one's feeling of social-emotional well-being. Critics of this viewpoint might reply that any decrease in self-concept as a result of the more implicit guidelines of the invisible pedagogy would be a temporary event and that uncertainties would be overcome in time. Further testing towards the end of the second year of a particular classroom structure revealed the same trends as were reported for the first year's experience.

#### Conclusion

In making the distinction between invisible and visible pedagogies, Bernstein did not wish to argue that the invisible strategy necessarily disadvantages the working class child. On the contrary, it has the potential for incorporating different pedagogies practised in the home by

giving freer reign to each child's interests, abilities and personality than is offered by the visible pedagogy. The problems arise when the teacher fails to recognise differences in the backgrounds of her pupils and thus does not take them into account when planning an individualized educational programme for each child. To recognise not only the language differences but also the need for communicating the expectations of the school to both child and parents is the first step on the path to equal educational opportunity for all children, regardless of class background.

## Part II: Some Methodological Issues

In this section of the paper four methodological issues, which typically arise in classroom environment research, will be discussed:

1. Conceptual and operational definitions;
2. Illuminative and experimental evaluation designs;
3. The impact of the observer on the "ecology" of the classroom;
- and 4. The choice of an appropriate unit of analysis.

### 1. Conceptual and operational definitions

As we have seen in Part I much of the controversy has involved the definition of terms such as "open education", "informal education" and "traditional education". The first requirement of any research report in this area is to provide the reader with a clearly stated conceptual definition of his key terms. This feature is important not only for purposes of clear communication but also to allow the reader to interpret the findings within a theoretical framework. Thus the research is not merely descriptive of a particular classroom situation but the major results may be generalised to other situations which possess characteristics that are postulated by the theoretical model. For example, the "invisible pedagogy" concept was put forward by Bernstein (1975) in terms of the sociological theory of social control. This framework immediately permits the generation of hypotheses

about the socialisation processes involved in an invisible pedagogy, about the power relationships existing between teachers and children, and about the consequences of this form of social control.

Unfortunately, too many of the conceptual definitions of terms such as "open education" have either had no theoretical basis or the theoretical basis was implicit. In a recent review of definitions of "open education", Roseth (1977) argued that they may be classified as denoting either learning practices, learning assumptions or dimensions of learning. "Learning practices" definitions typically list a number of features that are claimed to occur with different frequencies in "open" and "traditional" classrooms, such as the organisation of activities and the grading of students. These are just two of fifteen practices listed by Stephens (1974) as differentiating "open" and "traditional" classes. The "learning assumptions" approach is exemplified by Barth (1972), who lists some twenty-nine assumptions about learning and knowledge. The "dimensional model" describes one or more educational dimensions upon which classrooms differ. The Bussis and Chittenden (1970) two-dimensional model of decision-making in the classroom is a well-known example of this model. According to Bussis and Chittenden's model, any classroom may be classified in terms of not only the teacher's contribution to decision-making but also the child's contribution to decision-making. This type of definition of classroom environment has the advantage over the two other approaches of possessing a theoretical foundation (i.e. decision-making theory) upon which to generate hypotheses and to interpret research findings.

The second aspect of the definition issue is the translation of a conceptual definition into an operational definition. Much of the early research into classroom environments assumed that in an architecturally open classroom an educationally open programme was operating. This assumption has since been shown to be false (Allen, 1976; Traub, Weiss and Fisher, 1974; Roseth, 1977). In fact, within any classroom there may be differences in children's activities in relation to their peers and teacher. Angus,

Evan and Parkin (1975) found that "within conventional and open plan classrooms teachers spent unequal amounts of time instructing certain children either individually or within small groups" (p.35). This result emphasises the need for careful observation of actual classroom practices. It is not sufficient to employ a rating scale of classroom practices which are obtained at second-hand from the teacher or even the principal, as one instrument, the Dimensions of Schooling Scale (Traub, Weiss, Fisher and Musella, 1972), does. Rating scales may contain abstract items such as the "provisioning for learning" sub-scale of the Walberg and Thomas (1971) teacher questionnaire which requires considerable interpretive skills on the part of the rater. This problem may apply also to observational instruments whose categories demand high-inference rather than low-inference judgements. In addition, many rating scales contain items which describe classroom activities that do not distinguish between "open" and "traditional" educational practices. Their value bias is such that all teachers would believe in them or at least answer the item in a socially desirable fashion.

## 2. Illuminative and Experimental Evaluation Designs.

The point to be made here is the need for evaluation of educational practices of any kind. This point would not have even warranted discussion some fifteen or so years ago, but in the current climate of defensiveness in the face of the "bore" of accountability some people would argue that "no news is good news". One example of this attitude is contained in the following statement:

"In Leicestershire, evaluation of innovations was seldom attempted. We were content to judge subjectively, to decide by the "feel" of the situation whether or not it was in the best interests of children" (Sealey, 1966, p.40).

It is apparent that the view that no formal evaluation is necessary in order to judge the success or otherwise (i.e., the effects) of an educational innovation is being confused with the issue as to whether

the evaluation is to be a comparative, experimental one or involve a descriptive, "illuminative" design. Educational evaluation as a field has moved beyond the rather myopic approach that the only valuable evaluation is one which sets up an experimental and control group and proceeds to compare them on the basis of certain "objective" measurements. It is generally recognised that there are occasions when the intensive description of a new educational practice is more appropriate than a carefully controlled experiment. The evaluation of the "new maths" approach to the teaching of mathematics is a powerful example of the difficulties involved in comparing two approaches with very different aims. It should not have surprised anyone that children taught by the traditional approach to mathematics which emphasised rote memory of arithmetical facts would perform better on arithmetic items and, conversely, that children taught the "new maths" would achieve higher scores in problem solving items. As Parke (1976) argued when discussing the field of developmental psychology, there are advantages to field research for solving certain problems and advantages for laboratory research in answering other questions. The issue here is for educational evaluators, teachers and administrators to decide which is the most appropriate way of answering the important questions in classroom environment research, not one of ruling out one approach or the other according to one's values about "hard" and "soft" research.

## 3. The Impact of the Observer on the "Ecology" of the Classroom

Now that it has been established that direct observation of a classroom environment is a necessary element of any evaluation of it, the issue arises about the possible effect of the observer on the on-going activities of the classroom. This problem has been of considerable concern to experimental psychologists in their attempt to devise "objective" measurements of the phenomena under investigation and to avoid changing

have been developed to overcome this problem. Biddle and his colleagues at the University of Missouri have developed a remote-controlled television monitoring system whereby two television cameras are linked with a mobile van. Another approach is the use of one-way mirrors which enable an observer to view, without himself being viewed by, children in the classroom. Tape recorders have improved to the extent that audio-recorders can be synchronised for two independent observers. Portable video-cameras enable much greater flexibility in the observation of teachers and children than was possible previously. The technology of devices which aid the observer to become an incidental part of the classroom has made this problem less acute than ever before, but some critics of the "objective" stance would argue that naturalistic settings are changed in subtle ways by the introduction of such devices.

On the other hand, if an illuminative evaluation design is chosen the presence of the evaluator in the classroom is no longer a problem. He becomes a element in a dynamic system and there is no attempt at objectivity on his part. He feels free to question the teacher and children about anything he observes in the course of his investigation. Stake (1967) has used the term "transactions" to describe the total educational environment of which the evaluator is part. It is important for him to ask direct questions of the participants in this environment rather than to try to obtain his evidence indirectly. He will also examine the innovations' antecedents and consequences. If, for example the observed antecedents of an innovation were not as intended - perhaps the previous teacher had been a poor one - then this would make the current teacher's task much more difficult. The attempt to include or exclude the possible impact of the observer on the ecology of the classroom, then, depends on the choice of evaluation design - either an experimental or an illuminative one.

This methodological issue, which arises in many research studies investigating classroom environment effects, has been discussed extensively (Hannan, 1976; Burstein and Smith 1977; Averch et al., 1972). The issue may be stated as follows: if the researcher hypothesises a relationship between a classroom environment and certain pupil outcomes then the appropriate unit of analysis becomes the class rather than each individual pupil's score. An assumption is made that the classroom environment established by the teacher has an effect which is not unique to each individual. That is, each pupil's score is not independent of those of the other pupils in his class and, therefore, the common statistical assumption of independence of score units is violated. The appropriate unit of analysis for a study of the effects of a certain classroom environment on pupil achievement becomes the class average of pupil achievement, just as a study of the effects of school atmosphere on pupil self-concept becomes the school average self-concept score.

Most of the research on classroom environments, including the influential studies discussed earlier (e.g., Bennett, 1976; and Traub, Weiss and Fisher, 1974), violate the statistical assumption of score independence by using individual scores as their unit of analysis. In answering this criticism the researchers usually point to the consistency of their results after their data have been subjected to several types of statistical tests. Nevertheless, previous research has indicated that data analysed at the individual level does not necessarily produce results consistent with data analysed at the class or school level (e.g., Burstein and Smith, 1977). Another rejoinder is the claim that a certain class environment does not have a uniform impact on all pupils, a point made earlier. Again, the fact that all the pupils are located in a given space where a certain atmosphere is created by the combination of that space and an educational approach delivered by a teacher or teachers means that the class score is the appropriate unit of analysis. The

satisfaction of this statistical assumption implies that future research into classroom environment effects will, of necessity, be conducted on a large scale if a sufficiently large sample of classes is to be observed, classified and their average "classroom environment" scores related to pupil outcomes.

#### Conclusion

At the outset it was argued that terms such as "open education" and "traditional education" were no longer useful to people interested in the educational process. Hill (1975) makes this point succinctly and has some thoughtful suggestions for future research in this field:

"The present healthy ferment in educational theory can only suffer from attempts to lump diverse trends together under the rubric of open education. Let us press for more specific and descriptive labels to identify the values, objectives or procedures that are being commended to us, so that our discussion may get down to particulars, employing the forms of discourse appropriate to the things being discussed" (p.11). Research into classroom environments will need to grapple with the complex methodological issues, including the knotty definitional problem, discussed in this paper.

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START AND SCHOFIELD.

TEACHERS AND PUPILS

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ABSTRACT

The relation between learning and teaching is fairly tenuous. Evidence suggests that only 10% of the variance in the learning outcome seems accountable by the variance in the teaching and/or teachers. In this study the attitudes and achievements of teachers were related to the attitudes and achievements of their pupils. Standardized tests of reading, number, general ability, as well as Likert and Semantic Differential measures of attitude were used with 70 teachers and 2000 children.

SUMMARY

150 teachers co-operated in undertaking a battery of tests. This included - achievement in reading and number (ACER tests), a Likert Attitude Test compiled by one of the authors from existing tests, and a Semantic Differential. The inter-relation of these measures will be monitored. Of those teachers, who in the experimental year were teaching Grade 3 or above (permitted group testing), a similar battery was applied to the children in their classes (70), in February and repeated in November of one year. The interaction of the child pretest and of the post-test measures will be monitored. The inter-relation between the teachers data, the two sets of pupil data, and the gain between pupil test/retest will be discussed.