SCHOOL DISCIPLINE: EXPLANATIONS AND EFFECTS
A MCPHERSON AND P MUNN

(Award reference number R000234933)

SUMMARY OF RESEARCH RESULTS

1. Teachers' perceptions of SES and ability
   - Teachers were in greater agreement among themselves concerning their school's SES characteristics than their school's ability characteristics.
   - Schools which attracted a low ability rating from teachers tended also to rate low on SES. These covariations were owing largely to differences among schools rather than among teachers.
   - 60% of the variation among schools in teachers' perceptions of SES and ability could be explained by relatively objective school descriptors, and especially by pupil SES.

2. Teachers' perceptions of discipline
   - Variations among schools in perceived disciplinary climate were substantially lower than the variations in perceived SES, but substantially higher than any of the measures of pupils' reports of their own or their fellow pupils' behaviour.
   - We could explain about one third of the variation among schools in teachers' perceptions of the incidence of major indiscipline, and about half of the variation among schools in perceptions of minor indiscipline in the school and of minor indiscipline in the classroom.
   - These explanations were in terms of the teachers' perception of the SES level of a school, indiscipline being more commonly reported in schools with a lower mean SES. This was an effect of school SES, not attainment, because in a model which included both SES and attainment, the latter had no effect.
   - This effect of school SES was largely, though not wholly, mediated through teachers' perceptions of school SES.
   - Woman teachers reported lower levels of indiscipline, both in their own classrooms and around the school.

3. Effect of teachers' perceptions on pupils' attainment
   - Almost 80% of the variation in attainment among schools could be explained by differences among schools in the SES of their pupil intakes.
   - Teachers' perceptions of school SES and teachers' perceptions of school ability each explained some of the variation among schools that was not attributable to individual-pupil SES.
• These teachers' perceptions of the ability and SES of their school added less to the explanation of variations in pupil attainment among schools than did the variables that measured school context.

4. Pupils' experiences of indiscipline

**Truancy**

• Girls were as likely to truant as boys. Pupils with low attainment or low SES truanted more often.

• Truancy was more common in non-denominational than in Roman Catholic schools. Truancy was more common in schools where teachers believed there was a wide spread of ability among the school's pupils.

**Punishment**

• Punishment was more common among boys than among girls. It was also more common among pupils of low SES or of low attainment, and was more common in schools of low average attainment.

• A pupil of fixed SES and attainment, in a school of fixed social composition, is punished more often if fellow pupils' attainment is low. There was more punishment in Roman Catholic schools than in others.

• There was no evidence that teachers' perceptions of pupil SES or pupil ability had an effect on the level of punishment independent of the objective SES and ability of the pupils. There was also no association between teachers' perceptions of level of overall indiscipline and the level of punishment

5. School climate

There is a distinction between two senses of the term "school climate". In the first sense, the term describes what is salient about a school to pupils or teachers. The second sense goes beyond description and postulates the existence of a set of intentions, perceptions and beliefs held variously by pupils and teachers in a school.

An account of school climate must specify the mechanisms by which common understandings and agreements are produced, or not, and the part they play in the overall functioning of the school. In any particular instance it is an open question whether statistical agreement, in the sense of a tendency towards a common response, is itself the product of explicit substantive agreement among teachers, and of shared understandings of constructs to which they are commonly explored - in other words, of a climate in the second sense. We have evidence that there was a climate of this sort in relation to teachers' perceptions of the extent of economic deprivation, and - to a lesser extent - in relation to their perceptions of pupils' ability. Compared to these dimensions of SES and ability, there was very little evidence of a purposive climate in relation to perceptions of indiscipline.
SCHOOL DISCIPLINE: EXPLANATIONS AND EFFECTS
A McPherson AND P Munn

(Award reference number R000234933)

REPORT OF RESEARCH ACTIVITIES AND RESULTS

1. Background

Discipline is a term which connotes both social control and authorised knowledge. This helps to explain, first, why studies find that discipline can be a key to understanding the school as a social institution and, second, why discipline can relate closely to the effectiveness of schools in promoting learning and other outcomes.

These two aspects of interest in discipline are reflected in two overlapping literatures. The first literature derives from the classic Mertonian analysis of deviance (Merton 1957) as applied to pupils and schools (Woods 1983) and tends to be interactionist or ethnomethodological in approach (though not to the exclusion of measurement). This literature tends to view discipline as a concept that is ‘essentially contested’ in pupils’ and teachers’ negotiations over the nature of knowledge and over the purposes and moral order of schooling (Ball 1981; Galloway et al 1982; Lacey 1970; Reynolds 1976; Woods 1983). Furthermore, the context dependent meaning of discipline is frequently emphasised. What counts as indiscipline can vary from teacher to teacher and even the same teacher may vary as to what he or she counts as indiscipline according to circumstance. Measurement, though often used, is rightly seen as problematic, and studies are rarely, if ever, designed to achieve statistical modelling of relations between individual pupils and the classrooms or schools in which they are grouped.

A concern with such methodological issues is also a feature of the second literature which has informed the research: that on school effectiveness (for reviews see Brown and Riddell 1992; Mortimore 1992; Reynolds 1985, 1991, 1992; Reynolds and Cuttance 1992; and Willms 1992). Discipline may feature in this work as either a dependent or independent variable, though there is invariably an interest in explaining pupils’ learning. Disciplinary regimes of sanctions and rewards are found to relate to other aspects of school ethos and organisation (Mortimore et al 1988; Reynolds et al 1987; Rutter et al 1979), though the effects of these on pupil progress are not always consistent from one study to the next (ibid; Smith and Tomlinson 1989).

Discipline is thus a key issue in the relations between teachers and pupils, and it is intimately associated with the impact of schooling on pupils’ learning and other experiences. Discipline may be a precondition for learning, or a curricular end in itself. In several key aspects, therefore, discipline is intimately related to the nature, purposes and effectiveness of schooling.

2. Objectives

The research had five main objectives.

1. It aimed to improve understanding of discipline as an issue in relations between teachers and pupils. Specifically it set out to explore the connections between teachers’ and pupils’ perceptions of discipline and of indiscipline and other features of schooling. These features included i) the social composition of schools; ii) teachers’ perceptions of the ability and iii)
socio-economic status of pupils; iv) the value added by schools to pupils’ attainments in public examinations in S4; and v) other pupils’ experiences at school including attendance.

2. It aimed to make methodological advances by combining surveys of large numbers of individual teachers and pupils and analysing the merged data in a multilevel framework.

3. It hoped to make further methodological advances in terms of sampling, generalisability and in the use of information about school history and other characteristics in the multilevel models developed.

4. It hoped to chart changes in pupils’ perceptions of indiscipline over time.

5. It intended to place policy debates about indiscipline, school performance indicators and better information for parents on a sounder theoretical and methodological footing and on the basis of evidence. In particular, it aimed to contribute to the debate about the meaning, importance and effects of school climate or ethos as a key feature affecting school effectiveness.

These objectives were developed into more precise research questions which are detailed in the proposal. Essentially, three strategic questions guided the research: i) What is the extent of variation within and among schools in teacher’ and pupils’ perceptions of indiscipline and related factors? ii) Can this variation be statistically explained in terms of the characteristics of pupils, teachers or schools? iii) What are the consequences of schools’ disciplinary regimes for pupils’ outcomes.

3. Research design and methods

A major barrier to progress in understanding how discipline is constructed in schools and between teachers and pupils in classrooms has been the trade-off between ethnographic sensitivity and statistical power. However, advances in multilevel statistical methods now allow one to exploit key features of ethnographic accounts with statistical models. The design set out to explore teachers’ and pupils’ interactions with groups and schools and to measure the variation within and between schools in teachers’ and pupils’ perceptions of indiscipline and in pupils’ reports of their own indiscipline.

3.1 Data and design

The design drew mainly from two extant sources - the Scottish Young People's Survey (SYPS) (Raffe, 1988), originally funded by the SOED and the Department of Employment, and surveys of teachers' perceptions of indiscipline conducted in 1992 by the Scottish Council for Research in Education (SCRE) (Johnstone and Munn, 1992), originally funded by the SOED. The data from the 1991 SYPS were linked to the SCRE data to give us direct measures of the characteristics, perceptions and beliefs of:

1. headteachers in almost all Scottish state-sector secondary schools (about 420);
2. approximately 8 teachers in each of 112 of these schools;
3. individual pupils in a 10% sample from these schools.

(Except where otherwise specified below, the term 'teachers' includes heads.)

To deal with the context-dependent nature of discipline, the surveys of teachers asked about the incidence of specific pupil behaviours in a given week, and whether these behaviours were difficult to deal with; they also distinguished between behaviour in the classroom and behaviour
around the school. For similar reasons, the surveys of pupils asked about behaviour in the English classes, as well as about general disciplinary features of the school.

It was not possible to link individual teachers in sets 1 and 2 to individual pupils in set 3: thus we were able to study the influence of teachers on pupils only through the collective characteristics of teachers in a school.

This multilevel design allowed us to consider explanations coming from the literature on discipline and the literature on school effects. The extent of the data gave the analysis greater statistical power than typically has been available in other UK studies. The strengths of the design were:

1. It gave us a representative sample, not only of pupils, but also of schools and teachers.
2. It allowed us to respect variability among schools in perceptions of discipline and in the characteristics of pupils and of teachers.
3. It allowed us to investigate whether the relationships among these measures also varied among schools.
4. It allowed individual behaviour and perceptions (whether by teachers or by pupils) to be modelled in terms of characteristics of the school.
5. It allowed us to explore the significance of a school's practices (whether the causes or the consequences of these) in the context of the school's external and internal environment.

3.2 Preliminary analysis

Before we embarked on the main statistical analysis, we prepared summary measures of three areas of the data.

1. Summary of the socio-economic status (SES) of the pupils

   This was obtained by means of Principal Components Analysis of 11 measures of the SES of pupils, from the SYPS. These 11 recorded the educational level of parents, the type of occupation of the parents, the characteristics and level of the parents' paid jobs, whether or not the household was headed by two adults, the number of siblings, and the type of housing tenure. There were four principal components that we label as follows
   - father's occupational status
   - mother's occupational status
   - parental education
   - household composition.

2. Summary of teachers' perceptions of the SES and ability of the pupils

   Teachers rated the proportions of the school's pupils who came from "relatively prosperous areas"/"neither prosperous nor economically disadvantaged (areas)"/"economically disadvantaged areas". Each element (eg "relatively prosperous") was judged on a five-point scale. Again on a five-point scale, teachers rated the proportions of the school's pupils who were "above average ability"/"middling ability"/"below average ability".

   The responses were treated both as discrete measures (eg proportion "prosperous", rated on a five-point scale) and as continuous scales of perceived SES and perceived ability (each a function of three five-point ratings). The continuous scales measured both means and
dispersions (ie the tendency of a school's pupils to fall in the middle category rather than in one or both of the extreme categories).

3. Summaries of teachers' and of pupils' perceptions of discipline

The SCRE study collected extensive measures of teachers' perceptions of the incidence of indiscipline and of their approach to the issue. The measures reflected a view of discipline as a social construction that was continuously negotiated among individual teachers and pupils in school- classroom- and other settings. A Principal Components Analysis identified five main factors that statistically described these measures. Much of our analysis concentrated on three of these:

- the incidence of major indiscipline in school or classroom
- the incidence of minor school-based indiscipline
- the incidence of minor classroom-based indiscipline.

The two other scales measured the frequency with which teachers used different approaches to the maintenance or restoration of discipline.

3.3 Main analysis: multilevel modelling

The multilevel modelling used the package ML3 (Prosser et al 1990). Six main groups of dependent variables were studied:

3.3.1 Teachers' perceptions of SES and of ability (measures constructed in 2 in the Preliminary Analysis).

There were three purposes here:

1. To assess the extent to which these perceptions varied among and within schools.
   This analysis could provide some evidence on the existence of a school climate defined by teachers' attitudes.

2. To examine the covariation of these perceptions with each other, both within and among schools.
   This allowed us to ask whether any such climate is composed equally of perceptions about different features of the pupils.

3. To relate the variation and covariation to measured characteristics of the schools or of the teachers.
   This allowed us to begin to offer explanations for the agreement or otherwise among teachers about the nature of the school. In particular, it was possible to investigate whether teachers' perceptions were consistent with measures of SES and of ability derived from the SYPS questionnaires to the pupils (the SES summarised as in 1 in the Preliminary Analysis).
3.3.2 Teachers' perceptions of discipline (measures constructed in 3 in the Preliminary Analysis).

The same three purposes were served here as in 3.3.1, but without the capacity to use the SYPS as an independent check of teachers' perceptions. (The questions asked in the SYPS did not coincide sufficiently closely with those asked by SCRE.)

3.3.3 Covariation of teachers' perceptions of discipline with their perceptions of SES and ability.

This allowed a first assessment of the proposition that perceptions of disciplinary climate are influenced by perceptions of the SES or ability of the school. In a model which controlled also for the SYPS-derived measures of pupil SES and ability, we could assess the independent influence of teachers' perceptions of SES and of ability independent of direct influences from measured pupil characteristics.

3.3.4 Effect of teachers' perceptions of SES, ability, and discipline on pupils' attainment.

This model related to the debate about the influence of teachers' expectations on pupil experiences; distinctions were drawn in the analysis between headteachers and others. We were able to control here for many of the possible mediating variables between teacher expectations and pupil behaviour - for example, the measures of pupil SES derived from the SYPS, the aggregation of these to the school level (measuring the collective SES of the school), the gender of the pupil, and the denomination of the school.

3.3.5 Variation and covariation in pupils' experience of punishment and in their feelings about their fourth year at school (measures directly from SYPS questionnaire).

As in 3.3.1 above, this gave some indication of the source of influence on perceptions: for example, a high proportion of variation at the school level in feelings about fourth year would suggest (though not prove) that there is an influence of the school on these feelings.

3.3.6 Effect on the variances and covariances in 3.2.5 of characteristics of the pupils, teachers and schools.

Examples of the pupil characteristics were: attainment, SES, gender. Examples of the school characteristics were: aggregated attainment, aggregated SES, denomination. Because we were not able to link individual teachers to individual pupils, the teacher characteristics had to be aggregated to the school level and treated as school characteristics. The important ones tested here were: teachers' perceptions of discipline, of SES, and of ability. Again, distinctions were drawn between headteachers and others. This analysis could contribute to explaining schools' influence on pupils' experience, and in particular could help us understand the role which teachers play in forming these experiences.
4. Results

4.1 Teachers' perceptions of SES and ability

1. Variation among and within schools

A little over half of the variation in teachers' perceptions of the mean ability of pupils in their school lay among schools and about 19% of teachers' perceptions of the dispersion of their pupils' ability. By contrast about 70% of the variation in teachers' perceptions of their pupils' mean SES lay among schools and just over a third of teachers' perceptions of the dispersion of their pupils' SES.

The ratio of the among-school variance of a measure to its total variance can be interpreted as a measure of agreement/reliability. Thus teachers were in greater agreement among themselves concerning their school's SES characteristics than their school's ability characteristics.

2. Covariation among and within schools

Schools which attracted a low ability rating from teachers tended also to rate low on SES and to be rated high on dispersion (i.e. with low proportions of pupils respectively in the categories of "middling ability" and of "neither prosperous nor economically disadvantaged"). These covariations were owing largely to differences among schools rather than among teachers. For example the correlation of perceived mean ability with perceived mean SES was 0.94 among schools, but only 0.29 among teachers.

3. Relating (co-)variation in teacher's perceptions to teacher- and school characteristics

For both teachers' perceptions of mean SES and their perceptions of mean ability, about 60% of the variation among schools could be explained by relatively objective school descriptors, and especially by the four measures of pupil SES, aggregated to school level. Teacher characteristics explained very little of the variation in perceptions among teachers. Much less of the variation among schools in the perceived SES or ability dispersion of their pupils could be explained (about one quarter), but the variation among teachers in their perception of the SES dispersion was systematically related to two aspects of their position: the higher the level of post held, the larger was the perceived size of the middle group ("neither ... prosperous nor ... disadvantaged"); the longer the years of service, the larger was the proportion of pupils placed in one or both of the two extreme categories. These factors were generally not related to teachers' perceptions of the ability dispersion, although headteachers and possibly principal teachers perceived a larger middle-ability group than did the others.

4.2 Teachers' perceptions of discipline

1. Variation among and within schools

About a quarter of the variation in major indiscipline lay among schools, as did about one-fifth of the measures of minor indiscipline in school or in classroom. These variations among schools in perceived disciplinary climate were substantially lower than the variations in perceived SES or ability reported in 4.1, but substantially higher than any of the measures of pupils' reports of their own or their fellow pupils' behaviour (see 4.5).
2. Covariation within and among schools.

Among the three main scales of interest, there were high correlations both at the school level (correlations of about $r = 0.9$) and for individual teachers ($r = 0.6$). The design did not allow us to apportion variation among classrooms within schools.

4.3 Covariation of teachers' perceptions of indiscipline, SES and ability

We could explain about one third of the variation among schools in teachers' perceptions of the incidence of major indiscipline, and about half of the variation among schools in perceptions of minor indiscipline in the school and of minor indiscipline in the classroom. For each scale, only small amounts of the variation among teachers within schools could be explained.

There was a clear link between teachers' perception of indiscipline and the SES level of a school, indiscipline being more commonly reported in schools with a lower mean SES. This was an effect of school SES, not attainment, because in a model which included both SES and attainment, the latter had no effect. There was no such link with the spread of SES.

This effect of school SES was largely, though not wholly, mediated through teachers' perceptions of school SES. Certainly, in schools of given objective SES, teachers reported more indiscipline where they also reported lower SES. But also in schools where teachers reported a given level of SES, they had a slight tendency to report more indiscipline where the objective SES was lower.

Woman teachers reported lower levels of indiscipline, both in their own classrooms and around the school.

4.4 Effect of teachers' perceptions on pupils' attainment

About 9% of the variation in attainment was among schools and about 91% was among pupils.

All four dimensions of pupil SES contributed to the explanation of attainment, especially those relating to father's occupation and the level of parental education. Together with gender (females attained higher than males) they explained only about 15% of the variation in attainment among pupils.

Almost 80% of the variation in attainment among schools could be explained by differences among schools in the SES of their pupil intakes. In turn, about 80% the effect of these differences (ie about 64% of the total variation) could be attributed to the effect of the individual pupil's SES on his or her own attainment. The remainder of the effect could be attributed to the average social composition of the school, commonly known as the "contextual effect".

We tested three explanations for the variation among schools in attainment net of pupil SES. These explanations were in terms of:

- school context
- teachers' perceptions of school SES
- teachers' perceptions of school ability

Teachers' perceptions of school SES and teachers' perceptions of school ability each explained some of the variation among schools that was not attributable to individual-pupil SES, jointly raising the percentage of among-school variation explained from about 64% to about 74%.
These teachers' perceptions of the ability and SES of their school added less to the explanation of variations in pupil attainment among schools than did the variables that measured school context. The latter raised the among-school variation explained from 64%, when only individual-pupil SES was controlled, to 79%.

Although teachers' perceptions of the ability and SES composition of the school explained less of the variations among schools in pupil attainment than did differences among schools in SES composition or "context", teachers' perceptions nevertheless contributed to the statistical model's explanation of pupil attainment. When a full set of measures of teachers' perceptions of ability and SES was added to the model, the coefficients for the variables measuring school context each fell (by a quarter or less) and there was a statistically significant increase in the among-school variance explained (from 79% by pupil SES and school context, to 82% when measures of teachers' perceptions were added.)

4.5 Variations and covariations in pupils' experiences of indiscipline

We have fully analysed only two dimensions of this - truancy and punishment. We have chosen to concentrate on them because they are currently of policy interest.

Truancy

About 4% of the variation in truancy was among schools and 96% was among pupils. It was possible to explain a third of the school variation and a tenth of the individual variation.

Girls were as likely to truant as boys. Low attainers truanted more often, but the link was stronger in some schools than in others. Low SES pupils truanted more often, but this effect was not mediated by the school. Pupil SES accounted for about one-third of the association between pupil attainment and truancy; if SES is a proxy for prior attainment, this suggests that the association between low attainment and truancy is mainly because truancy causes low attainment, rather than the other way round. But even among pupils of equal attainment, low pupil SES was linked to truancy. Low paternal SES, low parental education and living in a household that was not headed by the two birth parents each increased the probability of truancy by as much as low pupil attainment.

Several school factors affected truancy. It was more common in non-denominational than in Roman Catholic schools with given pupil intakes and levels of attainment. The most noticeable link was that between truancy and teachers' beliefs about ability differentiation. Truancy was more common in schools where teachers believed there was a wide spread of ability among the school's pupils. The effect on truancy of this belief was about half that of the effect of school denomination, and a third of that of actual pupil attainment, and it was "net" of the effects of the actual level and spread of SCE attainment in the school (the effects of which were themselves statistically non-significant). There was no effect on truancy of teachers' belief either about the level of ability in the school, or about the level and spread of pupil social background.

Punishment

3.9% of variation in pupils' experience of punishment lay among schools; this is less than half of the among-school variation in attainment at 16 years. Punishment was more common among boys than among girls. It was also more common among pupils of low SES or of low attainment. Punishment was also lower in schools with low average attainment (net of individual attainment), but there was no such effect of average SES. We cannot say whether schools became low attaining because they used punishment more, or use punishment more
because they are low attaining. Only about one third of the among-school variation in punishment is explained by attainment and SES factors.

There is a link between incidence of punishment and value-added: a pupil of fixed SES and attainment, in a school of fixed social composition, is punished more often if fellow pupils' attainment is low. There are no variance effects on punishment: ie nothing to suggest punishment is higher, on average, in a "polarised" school. There was more punishment in Roman Catholic schools than in others, even after allowing for the SES characteristics of their intake. There was no evidence that teachers' perceptions of pupil SES or pupil ability had an effect on the level of punishment independent of the objective SES and ability of the pupils. There was also no association (adjusted or unadjusted) between teachers' perceptions of level of overall indiscipline and the level of punishment.

4.6 Discussion

School climate: statistical and substantive agreement

What light does our study of discipline throw on the nature of school climates and of school contexts? In answering these and similar questions one must bear in mind the distinction between explanations and statistical models. We have used measures of statistical agreement/disagreement among and between pupils and teachers in schools. But in any particular instance it is an open question whether statistical agreement, in the sense of a tendency towards a common response, is itself the product of explicit substantive agreement among teachers, and of shared understandings of constructs to which they are commonly exposed. Where, as in the instance of teachers' perceptions of the extent of "economic deprivation" among their pupils, most of the variation in perceptions among teachers can be explained by differences among schools (rather than differences among teachers within each school), and where those differences among schools can themselves be very largely explained statistically by reference to an independent set of measures, namely pupil SES, then it is more plausible to infer that teachers, within and across schools, operate largely, if not entirely, with a shared construct (of economic deprivation), apply these consistently in particular instances, and probably are in explicit substantive agreement when questions related to deprivation arise.

One reaches analogous conclusions with less confidence in relation to teachers' perceptions of their pupils' ability where less of the total variation lies among schools, and with less confidence still in relation to teachers' perceptions of indiscipline, where most of the variations in perception are attributable to teachers rather than schools, and where the school variations in perception are only weakly related to pupil experience and perception, if at all.

In other words, an account of school climate must specify the mechanisms by which common understandings and agreements are produced, or not, and the part they play in the overall functioning of the school.

School climate: descriptor or alterable variable?

Following from this, we note the distinction between two senses of the term "school climate". In the first sense, the term does nothing more than describe what is salient about a school to pupils or teachers. Nevertheless, it is important to know, as this study demonstrates, that pupils in schools with predominantly low-SES pupil intakes tend to be seen by their teachers as more deprived, less able, and more undisciplined than pupils in other schools; that the pupils themselves report a more troubled classroom environment, and that they tend to respond in more alienated ways. This sense of school climate is inferred in this study by statistical models based largely on unadjusted correlations.
The second sense of "climate" goes beyond the type of description just outlined and postulates the existence of a set of intentions, perceptions and beliefs held variously by pupils and teachers in a school, which are integral to processes and outcomes in the school, but which are manipulable. Such postulates and processes are tested in this study by statistical modelling.

**Modelling climate and process: some strengths and weaknesses**

We have been able to study the experience of discipline across an entire school system with measures collected from pupils independent of those collected from teachers. Nevertheless, our ability to infer from our statistical models to the role of disciplinary climates in school processes and outcome is circumscribed by other features of the design.

Our first measure of attainment is taken at 16 years; we may therefore have underspecified differences among pupils and schools in attainment at earlier stages, and correspondingly over-estimated the statistical and explanatory importance of other differences between pupils and school. We had rich information on within-school variances, but we lacked information on classroom composition both for pupils and for teachers; at the level of classrooms, therefore, more may be manipulable in the schools than our models have identified.

Our models of schools have been cross-sectional and we can infer only weakly, therefore, from correlation to cause.

The reflexive nature of school policy and practice makes the interpretation of the size and direction of all correlations problematic - for example effective positive discrimination policies targeted at vulnerable groups could attenuate or reverse a correlation between vulnerability and the outcome in question.

**Models and explanations**

Our move from models to explanations depends heavily on the valid partitioning of variance among our measures. Each of the difficulties just listed might compromise the validity of this procedure, with major implications for our conclusions.

One example can serve. In many of our models we have been able to explain a large proportion of the variation in outcomes among schools. But some statistically significant variation often remains and, most notably, the school-level correlations are reduced by very little. We cannot dismiss the possibility that this residual variation among schools is an artefact of statistical underspecification in our models having few or no implications for substantive theory. But nor can we ignore the possibility that, in a fixed population of schools, it is the very fact of differences between one school and another, however small those differences be, that feeds comparisons between the schools and thereby constitutes a substantively important aspect of climate for pupils and teachers in both.

**5. Intended activities**

Given the complexity of the multilevel models we have been running, it would have been premature to disseminate research findings before we had confidence in them. The following activities are planned:

1. A seminar for colleagues at the Centre for Educational Sociology on 30 March 1995.
2. A seminar for teachers, held at a major conference at Moray House on April 25 1995.


6. Outputs

The timescale of the project (one year) and the nature of the research mean that we have not been in a position to write articles until now. The following are planned:

3. A paper on the policy implications of our work in terms of school ethos as an explanatory variable for school effectiveness to be submitted to the Journal of Educational Policy.
4. In the longer term we are planning a book.

7. Impacts

None as yet; nor would we expect any at this stage in our work.

8. Future research priorities

1. Complete the analysis of pupils' experience of indiscipline.
2. A further exploration of pupil measures to explore the lack of variation in response among pupils attending different schools and to help extend understanding of pupil culture.
3. Using follow up data from the 1991 young people’s survey to explore the connections between teacher and pupil perceptions of indiscipline and labour market outcomes.
4. Exploring changes over time in pupil perceptions of indiscipline.
5. Take advantage of multilevel techniques for incorporating estimates of the reliability of measures into regression analysis. (The software for this was not readily available while we were doing this project.)
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