Fuzzy Generalisation: transforming research findings into fuzzy predictions which can inform teachers', policy makers', and researchers' discourse and action¹

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In this set of papers Michael Bassey puts the case for generalising from empirical findings to fuzzy predictions and Sue Hallam, Andrew Pollard and Anne West give examples of fuzzy predictions that arise from their substantial empirical researches. Bob Stake's comments were made as the invited discussant of the AERA symposium at which these papers were presented in Seattle in 2001.

Paper 1: THE CONCEPT OF FUZZY GENERALISATION

Michael Bassey

Abstract and personal statement

In a paper published in the *Oxford Review of Education* (March 2001), I offer a solution to the problem of generalisation in educational research in the form of fuzzy prediction. I argue for a way of encapsulating research claims-to-educational-knowledge by drawing on a concept of fuzzy logic. Using this approach research findings can be communicated to would-be users in a tentative but memorable form. The present paper summarises the argument and gives examples.

A solution to the problem of empirical generalisation

'Generalisation is supposed to be a major aim of educational research' Verma and Mallick (1999:198)

The problem of generalisation has long been a stumbling block for researchers across the social sciences. This paper is concerned with the kind of empirical generalisation which summarises sets of events in particular sites and makes predictive statements about future events in other sites.

In terms of educational research, for example, teachers and policy-makers seek clear statements like, 'do x in y circumstances and z will be the result'. In a nutshell, they are asking researchers to identify 'what works'. But researchers are unable to make such predictions because of the complexity of the notion of 'y circumstances'. Putting it another way, there are too many uncontrolled variables in most social settings for straightforward statements like this to be made.

Recently, and drawing on ideas from the field of fuzzy logic, I have recognised that it can be helpful to make predictive statements like, 'do x in y circumstances and z *may* be the result'. (Bassey, 2001) Such statements have a built-in tentativeness: I have called them 'fuzzy generalisations'. Instead of 'what works', a fuzzy prediction states 'what *may* work'.

A fuzzy prediction replaces the certainty of a scientific generalisation (x in y circumstances *will* result in z) by the fuzziness of a generalisation that contains a qualifier (x in y circumstances *may* result in z). Alone, a fuzzy prediction is no more than the researcher's equivalent of the politician's sound-bite, and as such may have little credence, but when supported by a research account which makes clear the context of the statement and demonstrates the evidence justifying it, the fuzzy prediction provides a powerful and user-friendly summary which can serve as a guide to professional action by teachers or political action by policy makers.

Fuzzy prediction invites replication and this, by leading to support for the statement, or its modification or amplification, can contribute to the edifice of educational theory.

The problem, of course, is that such statements embrace the idea that it will also be true that 'do x in y circumstances and *z may not* be the result'. Evidence that something 'may work' admits the possibility that it 'may not work'. Later I will suggest a way of handling this issue.

Illustration of the concept of fuzzy prediction

My three colleagues give examples of extensive research leading to fuzzy predictions, but at this stage let me give a different illustration. The National Foundation for Educational Research of England and Wales recently published the findings of a major research project into arts education in secondary schools. The main sponsors were the Arts Council of England and the Local Government Association (UK). A wealth of data on the effects and effectiveness of art education was amassed and a substantial report published. (NFER 2000). One way in which some of the findings can be articulated is in this fuzzy prediction:

In secondary schools with good reputations in the arts, education in the arts is likely to give:

- a sense of enjoyment, excitement, fulfilment and therapeutic release from tension;
- enhanced knowledge of social and cultural issues;
- development of creativity and thinking skills;
- enrichment of communication and expressive skills;
- advancement in personal and social development; and, perhaps in consequence,
- enhanced general academic performance in other subjects.

However, <u>in most secondary schools</u>, it is unlikely that education in the arts will lead to enhanced general academic performance in other subjects.

This is a statement which is usable by policy makers and school governing bodies: it is stark, memorable and based on trustworthy research. The latter point is made by the extent of the data-base (5 case studies of schools with good reputations in the arts; questionnaires from over 2,269 pupils in 22 schools with related assessment data; interrogation of existing data covering 27,607 pupils from 152 schools) and rigorous scrutiny of the full report. It is also a statement which points the way for further enquiry. Researchers can ask what a school may need to do to gain a 'good reputation in the arts'. Overall this statement illustrates the way in which a fuzzy prediction can inform the discourse of teachers, policy-makers and other researchers. It avoids the traditional problem in which researchers, being unable to say that something *is* the case in general, instead say much about each situation and in consequence lose their potential audience!

Characteristics of fuzzy predictions

I suggest that these are the characteristics of fuzzy predictions. They:

- have built in tentativeness;
- are generalised to an identified population and so go beyond the empirical research;
- are short and memorable;
- are written in user-friendly language; and
- convey a worthwhile idea.

As such a fuzzy prediction may be of little value ('anybody could write one of these on the back of an envelope'), but if supported by substantial research they deserve credence and merit professional attention to the findings. What is important is that there is a very careful choice of words which satisfies the demands of both truthfulness and effective communication.

When talking about this concept in England at a meeting of researchers and users of research, I found that the latter welcomed the idea while the former had to be coaxed out of concern that such statements were naive. I had suggested the kind of fuzzy predictions that could arise from the research projects of eight research teams represented at the meeting. They included phrases like: 'If teachers use X then most pupil motivation levels are likely to be enhanced', 'Use of this diagnostic instrument may prompt changes in classroom practice', 'The problem-based curriculum Y is likely to enhance the learning of more students than a traditional lecture-based curriculum'. Several teachers and educational managers in the audience said this was what they wanted from research, but the researchers tended to cringe at the simplicity of the statements. Was this in the defence of truthfulness, or in defence of the time, effort and expense of the research? My own position is that as a research

community we need to keep telling both those who fund us and those who may use our research, that simple findings can demand very substantial effort in order to demonstrate their trustworthiness.

Best estimate of trustworthiness

In reporting on empirical research and drawing a fuzzy prediction from it, I believe it is most important to ensure that the empirical findings are clearly separated from the prediction. We must not be fuzzy with the truth! Readers must be clear on what has been empirically demonstrated for the sample or the case, and what is being predicted, fuzzily, for a larger population.

This brings me back to the issue that predicting that 'x in y circumstances may lead to z' necessarily embraces a second prediction that 'x in y circumstances may not lead to z'.

I believe this can be overcome by making a *best estimate of trustworthiness (BET)*. I perceive this as a professional judgement (based on the experience and understanding of the researcher), expressed in a fuzzy form like this: 'do x in y circumstances and z may be the case: the best estimate of trustworthiness is that this will be true in most instances'. It could be offered as a fuzzy percentage (ie between p% and q%) but qualifiers like 'a few', 'some', 'perhaps half' or 'most' are less problematic. Making such a BET takes the researcher beyond the empirical evidence of a research project, beyond the making of a fuzzy prediction, and into the realm of tacit and explicit professional knowledge. It requires the courage to be an educationist as well as a researcher! This should be no problem for those who include in their concept of educational research the idea that it aims 'to improve educational policy and practice, by informing pedagogic, curricular and other educational judgements and decisions' (BERA 2000:1)

Making a best estimate of trustworthiness demands that the researcher thinks about the empirical findings of a research project in terms of who may use it - and how useful it may be to them. It puts a particular focus onto the concept of 'y circumstances' and requires that this be the determinant of the population to whom the research applies. Thus a statement like 'do x in elementary school classes and z may be the result' is likely to have a low BET. But if the age and educational history of a class of children is included in the statement it may be possible to give a much higher BET.

The claim is that this is an approach to transforming research knowledge into a form which can readily enter the professional discourse through which teachers enhance their craft knowledge of teaching and so improve the learning of their students. Likewise it can enter the political discourse of policy-makers and inform their decisions.

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Paper 2: FUZZY PREDICTIONS AND ABILITY GROUPING IN THE SECONDARY SCHOOL

Sue Hallam

Abstract and personal statement

I was co-director of two major studies of structured ability grouping at primary and secondary level funded by the Economic and Social Research Council (UK). The secondary project, 'Ability Grouping in Schools: Practices and Consequences', examined the outcomes, personal, social and academic of over 6000 pupils in 45 secondary comprehensive schools in England. It also explored the attitudes and pedagogic practices of the teachers and the processes adopted within the schools for allocation of pupils to groups and movement between groups. 'Ability Grouping in the Primary School' explored, through interviews with head teachers, governors, staff and pupils, the processes, practices and perceived effects of different types of ability grouping ranging from streaming, through setting, to mixed ability teaching in six case study primary schools. The evidence from these projects led to the formulation of two fuzzy predictions: (1) *the adoption of structured ability grouping in schools may not improve academic performance;* (2) *the adoption of structured ability grouping in schools may not have an effect on the self-esteem of pupils*. The effects of structured ability grouping appear to be mediated by a range of factors including gender, pedagogical practices, school ethos, and the extent to which structured ability grouping is adopted.

Preamble

The evidence presented here is based on the findings of an ESRC funded project⁷ 'Ability Grouping in Schools: Practices and Consequences' which examined the outcomes, personal, social and academic of over 6000 pupils in 45 secondary comprehensive schools in England⁸. It also explored the attitudes and pedagogic practices of the teachers and the processes adopted within the schools for allocation of pupils to groups and movement between groups. The evidence from the project led to the formulation of two fuzzy predictions:

- 1) the adoption of structured ability grouping in schools may not improve academic performance;
- the adoption of structured ability grouping in schools may not have an effect on the self-esteem of pupils.

The effects of structured ability grouping appear to be mediated by a range of factors including gender, pedagogical practices, school ethos, and the extent to which structured ability grouping is adopted.

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The research

A stratified sample of 45 secondary comprehensive schools was selected for the study, representing a range of grouping practices, intake and location. The schools were selected to provide a range of ability grouping in the lower school, from completely mixed ability through years 7 to 9, to mainly structured ability grouping. The sample comprised three levels of ability grouping in the lower secondary school (Years 7 to 9), with 15 schools in each group:

'Mixed Ability Schools'	predominantly mixed ability classes for all subjects, with setting in no	
	more than two subjects in Year 9.	
'Partially Set Schools'	setting in no more than two subjects in Year 7, increasing to a	
	maximum of 4 subjects in Year 9.	
'Set Schools'	streaming, banding or setting in at least four subjects from Year 7.	

The schools were balanced across the three groups in terms of their size and the social mix of their intake, using free school meals as an indicator of social deprivation. Within each school all year 9 pupils participated in the research. This provided a sample of over 6000 pupils.

The project provided an analysis of pupils' attainments at the end of Key Stage 3 (age 14), taking account of their attainment at the end of primary school (Year 6, age 11), their self-concept using the Marsh Self-Concept Scale (Marsh, 1990), and attitudes towards school and different types of ability grouping.

The analysis

The level of setting in each subject varied. A five-point scale was constructed to indicate the amount of setting experienced by each pupil in each subject during years 7, 8 and 9. The five levels of setting are shown in Table 1 which also shows the strength of setting in each subject in the 45 schools. A scale point was added if the setting in year 9 was rigorous, e.g. up to 10 differentiated sets.

		English	Mathematics	Science
0	Mixed ability in years 7-9	20	5	11
1	Set in year 9 only	4	3	5
2	Set in years 8 and 9	6	7	13
3	Set in yrs 7-9, yr 9 broadly set	3	1	2
4	Set in yrs 7-9, yr 9 rigorously set	12	29	14

Table 1: Strength of setting in English, mathematics and science in 45 schools

A multilevel analysis was undertaken which took account of variation in the data at two levels, pupil and school level. Each curriculum subject was analysed separately. In each analysis, corresponding Key Stage 2 levels were used to control for intake differences, and hence for any differences between the schools. Gender, social disadvantage (indicated by eligibility for free school meals) and attendance were entered into the models as additional explanatory variables.

Effects on attainment

The numbers of pupils for whom both Key Stage 2 and 3 results were available were 4480 in English, 4337 in mathematics and 4499 in science. The effects on attainment at Key Stage 3 were analysed taking account of attainment at Key Stage 2, gender, social deprivation and attendance. For English, mathematics and science:

- pupils who did well at the end of Key Stage 2 did better on the Key Stage 3 tests;
- pupils eligible for free school meals made less progress between Key Stages 2 and 3;
- pupils' progress was related to their attendance;
- girls made more progress than boys in English. This was particularly the case for the pupils with lower attainment at Key Stage 2;
- boys made a little more progress than girls in mathematics and science.

Using the setting scale, the data for each subject was analysed to see if the extent of setting influenced attainment. Progress in English and science was not related to setting. For mathematics, the analysis showed that the lower attaining pupils at the end of Key Stage 2 made more progress in schools with more mixed ability grouping, whereas the higher attaining pupils made better progress in schools with more setting. The difference for pupils at level 1 at Key Stage 2 between the least and most set schools was 0.12 SD units. The difference for pupils at level 5 at Key State 2 was 0.36 SD units.

These analyses provide support for the effect of setting on progress in mathematics but not in English or science. The effect of setting in mathematics appears to act to the advantage of the pupils attaining higher levels at the end of primary school, whereas pupils whose attainment is low at the end of primary school make more progress in mixed ability classes. From this it is possible to make only a fuzzy prediction: *that the adoption of structured ability grouping in schools may not improve academic performance*. Key mediating factors appear to be the nature of the subject and the prior attainment of the pupil. Other possible mediating factors will be discussed below.

Effects on self-concept

Each of the sub-scales of the Marsh Self Concept scale correlated significantly with all the others. All three academic facets of the self-concept related strongly to the measure of general school self-concept, suggesting that pupils' perceptions of themselves in the curriculum formed a significant part of the way pupils felt about themselves in school.

Type of school, school self-concept and self-esteem.

For both self-esteem and general school self-concept the research revealed that:

- pupils who did well at the end of Key Stage 2 (year 6) had more positive self-perceptions at the end of Key Stage 3 (year 9)
- boys had more positive self-perceptions than girls, and
- pupils from more socially advantaged backgrounds had more positive self-perceptions than those from socially disadvantaged backgrounds.

Taking these factors into account, general self-concept and self-esteem were compared in the three types of school. This revealed that

- self-esteem and general school self-concept were higher in the partially set schools than in the set schools
- general school self-concept was higher in the partially set schools than in the mixed ability schools.

Setting and self-concept in English, mathematics and science.

When self-concepts for each subject were considered separately, the analyses revealed that

- in English, mathematics and science, self-concept rose with attainment;
- girls had more positive views of themselves than boys in English, but the difference was small;
- boys had more positive views of themselves than girls in mathematics and science;
- for science, the difference between the genders was greater for the pupils attaining higher levels at Key Stage 2.

When the effects of different levels of setting were considered, there were differences between the three curriculum subjects. There was no evidence of any effect of setting on self-concept in mathematics or science, either alone or combined with Key Stage 2 levels.

In English, for pupils average and above at Key Stage 2 (year 6), self concept fell as setting increased but for pupils below average at Key Stage 2, self concept rose as setting increased. In English, setting raised the self-perceptions of lower attaining pupils and lowered the self-perceptions of higher attaining pupils. These findings led to the fuzzy prediction that *the adoption of structured ability grouping in schools may not have an effect on the self-esteem of pupils*.

Mediating factors

The research attempted to identify those factors which might mediate the effects of different kinds of ability grouping. Through questionnaires pupils' attitudes towards school and different kinds of ability grouping were explored.

Pupils' attitudes towards school

The evidence regarding pupils attitudes towards school indicated that:

- Pupils from 'set' schools had the most negative attitudes towards school;
- More pupils in mixed ability schools reported getting on well with their teachers;
- More pupils in mixed ability schools agreed that they and their school were like 'good friends';
- In the mixed ability and partially set schools more lower attaining pupils viewed the school as a good friend;
- In all schools a small proportion of pupils saw the school as an enemy. These pupils were

predominantly the lower attaining pupils.

Preferences for different types of ability grouping

Overall, 60% of pupils indicated a preference for setting. The type of school that the pupils attended influenced their response. Preference for mixed ability classes was greater where pupils had experienced more mixed ability teaching (43%). Setting was the preference of 71% of the pupils in set and partially set schools and 41% of the pupils in mixed ability schools. These overall figures obscured very wide diversity. For instance, within the setted schools the highest preference for setting was 83% and the lowest 40%.

There were marked differences in the preferences of pupils from different ability groups for different kinds of grouping. A greater proportion of those in the lower sets for maths (the most frequently set subject) preferred mixed ability classes (39%) when compared to those in the middle sets (21%) or top sets (16%).

There were also gender differences in grouping preferences. Girls had a slightly greater preference for setting (65%) than boys (57%). Boys were more likely to prefer mixed ability classes (30%) than girls (21%).

There were also gender and attainment differences. In mathematics, 69% of boys in the top sets preferred setting while 21% preferred mixed ability, in the middle groupings the percentage preferring setting fell to 63% and in the bottom sets to 42%. For the girls the pattern was similar. 80% of girls in the top sets preferred setting, falling to 70% in the middle sets and 47% in the lowest sets. There appear to be two interweaving patterns, a greater preference of girls for setting alongside an increasing preference for setting if pupils were in the top set.

Social group differences in preference also emerged. There was a greater preference for setting amongst children not taking free school meals, 64% preferred setting and 22% mixed ability as opposed to those taking free school meals where the figures were 55% and 32% respectively. There was insufficient data to assess whether ethnicity was a factor in grouping preferences.

Satisfaction with different ability grouping practices

While the evidence indicated an overall preference for setting a sizeable proportion of pupils were not happy with the set that they were in and wanted to move to a different set. The largest proportion wanting to change set was in maths (39%), followed by science (32%) and English (26%). These proportions were mediated by the

type of school. The greatest proportion wishing to move in maths was in the partially set schools. In science and English it was in the set schools.

When pupils wanted to move set the great majority wanted to move to a higher set. This varied between 77% and 65% depending on the subject. Between 12% and 17% wanted to move to a lower set. Overall, a substantial proportion of pupils were unhappy with their placement in sets and the majority of those want to be in a higher set.

These differences were mediated by the type of school. In the setted and mixed schools a much greater proportion of pupils wanted to move to a higher set but not the top set. In the mixed ability schools the percentages of pupils wishing to be in the top set or another higher set were very similar. Regardless of type of school, it was in maths that the greatest proportion of pupils wished to move down to a lower set.

There were also gender differences in preference for moving set. Far more boys wanted to be in the top set than girls in all subjects. In maths 82% of the boys wanted to move into a higher set as opposed to 68% of the girls. This difference arose because a larger proportion of boys (34%) as opposed to girls (19%) wanted to be in the top set. The pattern was similar in science and English although the difference was much smaller. In all subjects the girls were more likely to want to move down to a lower set. This was particularly marked in mathematics (girls 23%, boys 13%).

Discussion

The evidence presented above suggests that the effects of ability grouping on pupils' attainment and selfconcept cannot be predicted with any certainty. Only fuzzy predictions can be made. The effects of ability grouping are mediated by the subject domain, gender, the prior attainment of the pupil and the type of school they attend. Further mediators, identified by other aspects of the research, include the way grouping practices are operationalised, teacher attitudes and the pedagogical methods adopted when teaching different types of group and different ability levels. Grouping structures of themselves do not necessarily have an impact on attainment or self-concept it is how they are put into practice within a particular school ethos which seems to be important.

How trustworthy are the fuzzy predictions that have been made here? The large sample size and the rigour of the research methodology indicate a strong 'best estimate of trustworthiness'. The predictions are likely to be true for all secondary schools in the UK. Whether they can be generalized further, to outside the UK, is less

certain. However, the findings from the international literature exploring the effects of structured ability grouping on the academic, personal and social outcomes for pupils have consistently been equivocal. This suggests that they may have some applicability outside the UK.

Paper 3: POSSIBLE CONSEQUENCES OF STRONG CONSTRAINTS ON TEACHERS AND PUPILS: SOME FUZZY GENERALISATIONS FROM THE PACE PROJECT

Andrew Pollard

Abstract and personal statement

I was director of a ten-year major study of English primary schools funded by the Economic and Social Research Council (UK). Known as the Primary Assessment, Curriculum and Experience Project (PACE) this documents the unfolding story of change in English primary schools resulting from government interventions starting from the Education Reform Act of 1988 and contains a wealth of data. I have recently formulated two fuzzy predictions that, despite important qualifiers, are strongly supported by the data. They appear to be obvious, but it is the case that the English government has not recognised their importance and significance. They are: (1) *if teachers are strongly constrained in their professional work they are likely to become disenchanted and this probably affects recruitment and retention;* (2) *if pupils are strongly constrained in what they do in school they are likely to become disenchanted and commitment to learning.*

Introduction

The Primary Assessment, Curriculum and Experience (PACE) project was established in 1989 to monitor the impact of the momentous changes then occurring in English primary education following the passing of the 1988 Education Reform Act. Independently funded by the UK's ESRC, the project was uniquely placed to document the unfolding story of change in primary schools and, in particular, the impact of the new National Curriculum and assessment requirements on headteachers, teachers and pupils. More specifically, the PACE project sought:

 to monitor changes in teachers' practices and pupil experiences in terms of curriculum, pedagogy and assessment;

- to investigate the consequences of national policies and the mediating effects associated with *teacher* perspectives, cultures, classroom behaviour and sense of professionalism; and,
- to investigate the consequences of national policies and the mediating effects which are associated with *pupil* perspectives, cultures and classroom behaviours.

A national sample of primary schools made it possible to record the changes teachers and pupils felt they were experiencing; to document the evolving school experience of a particular group of pupils throughout the course of their primary schooling; and to observe these experiences within many classrooms and staffrooms.

In one sense, the PACE project has documented the great *success* of the educational policies of successive UK governments. In the 1980s, teachers were deemed to have too much control over educational policy, practice and provision. Ministers declared that there had been 'producer capture' by the professionals, and the Conservative government resolved to wrest such control away. The result was the Education Reform Act 1988, annual rounds of supplementary legislation (on inspection, opting out, funding, training, etc.), a seemingly endless output of a series of educational quangos (NCC, SEAC, QCA, TTA, OFSTED, etc.) and repeated campaigns by media and politicians that have humiliated and undermined the public esteem of the profession. It is not surprising that many committed primary school teachers felt hurt and bewildered. After 1997, New Labour worked and invested to create a more systematic, national *system* for educational provision. With increasing coherence, this now embraces curriculum, pedagogy, assessment, teacher training, teacher supply, inspection, school development, funding, pay, target-setting, publication of results, the role of governors, parents, LEAs, consultants, etc., etc. We are thus a very long way now from the uneven quality and patchy provision of entitlements that characterised English primary education in earlier decades – some really excellent, some dreadful. Further, by 1999, there were consistent signs that standards of pupil performance were rising, at least for those subjects measured by SATs at age 7 and 11.

Perhaps then a first fuzzy generalisation should be:

Where a coherent, national education system is established and specific aims are specified and backed by high stakes assessment, inspection, financial rewards and sanctions, then measures of specified performance are likely to rise. This much describes the functioning of a system, and my Best Estimate of Trustworthiness (BET) on this is high, because of the structuring and power that is deployed. Perhaps this explains the global development of performativity in recent years, underpinned by perceived pressures of international economic competitiveness. However, this approach implies a view of education as a process of production, such as engineering or manufacturing.

It is the *unintended* consequences of such policy that produce the fuzzy generalisations on which this paper focuses. As we will see, there are particular doubts concerning pupil and teacher motivation. For the purposes of BERA's AERA contribution, I will identify, illustrate and discuss two key 'fuzzy generalisations – on teachers and on pupils respectively:

- 1. If teachers are strongly constrained in their professional work, they are likely to become disenchanted and this probably affects recruitment and retention.
- 2. If pupils are strongly constrained in what they do in school, they are likely to become disenchanted and this probably affects their motivation and commitment to learning.

In the spirit of this symposium, having reviewed the PACE evidence regarding these fuzzy generalisations, I will discuss their robustness and offer a Best Estimate of Trustworthiness (BET).

If teachers are strongly constrained in their professional work, they are likely to become disenchanted and this probably affects recruitment and retention.

Challenges to professionalism, work and values

The PACE book on primary school teachers describes their experience of the 'avalanche' of policy initiatives of the late 1980s and 1990s. We documented how they had felt increasingly besieged by critics and demands for accountability from outsiders, especially parents, whilst losing little of their deeply-held sense of moral accountability to pupils. We described many teachers' experience of increasing stress as the growing proliferation of external requirements left them less and less space for personal professional discretion. For many, the effects of this increase in pressure and constraint were exacerbated by their belief

that what they were being asked to do was not educationally desirable or in the best interest of their pupils. The increasingly high profile and externally-controlled national assessments provided one of the most widespread causes of such conflict. However, for some teachers, particularly those working with pupils from difficult social and economic challenged backgrounds, the National Curriculum itself caused stress and frustration since teachers felt it could not meet such children's particular needs.

Significant changes also characterised teachers' work and values. We found a growing sense of resignation and instrumentalism of many as they found themselves constrained in terms of curriculum content and teaching methods. As sensationalist and politicised debates rolled around in the media, the shift from professional autonomy to contractual responsibility as the basis for accountability was associated for many teachers with increased stress, value conflict and reduced job satisfaction. They began to feel bound by the demand for 'delivery of performance' - beyond all other considerations. Further, they felt that the more affective side of teaching – the sense of vocation and investment of self – was being undermined by pressure to become 'expert technicians' in transmitting pre-defined knowledge and skills to their pupils.

Teachers' strategic responses

In the circumstances of the early 1990s, teachers increasingly felt the need to work together to cope with the new challenges and its effects. Thus curriculum planning and whole-school co-ordination, preparation for inspection and external communication, as well as teaching itself, were increasingly likely to be characterised by teachers pooling their different knowledge and skills in complementary ways. At their best, these developments were highly creative and empowering, resulting in some, or all, teachers in the school feeling a new sense of professional achievement. Many headteachers developed and deployed considerable skills in managing these developments. Others however, perhaps finding the new challenges overwhelming, resorted to more autocratic methods. The latter were found to inhibit the development of collegiality and the incorporation of the National Curriculum into new forms of professional practice.

Overall, we found that where the individual teacher, or the school as a whole, lacked the confidence to engage in the 'creative mediation' of external policy directives, or where individual or personal circumstances made this difficult, the picture was likely to be one of conflict, stress and disillusion. A key variable in the capacity to cope with change was found to be confidence – both in terms of each individual teacher's professional skills and knowledge and more generally as a person. Some just could not cope – for instance, with greater subject knowledge requirements. Others, skilful, knowledgeable, committed and confident, simply became tired of the struggle or were unwilling to compromise. Many experienced teachers and headteachers took early retirement or left the profession under sickness schemes. Whilst the reconfiguration of the profession has continued through new training, appraisal and pay structures, our evidence showed that younger or more recently trained teachers accommodated to the new structures and requirements and began to take them for granted as 'the way things are'.

Classroom practice

The powerful combination of National Curriculum directives and public rhetoric on the one hand, and national assessment and OFSTED inspection requirements on the other, left little room for individual teachers or schools to redefine what was to be learned, when and to what standard. Discretion concerning time and space and control over the content of learning was increasingly denied to both teachers and pupils.

We summarise our classroom analysis in terms of curriculum, pedagogy and assessment. We found a situation in which the curriculum was increasingly strongly 'classified', in Bernstein's sense of an explicit division between subjects. Classrooms were also increasingly strongly 'framed', in that teachers' discretion over how to teach was progressively reducing and this structuring was being relayed on to pupils. Finally, assessment was becoming increasingly categoric, regular and high-stakes as requirements for accountability and performance measures became more prominent and explicit. The effects of the overall trend towards whole class teaching, greater teacher instruction, subject timetabling and ability grouping were thus reinforced by an assessment system which increasingly commodified achievement, shifting the educational balance in favour of cognition rather than affect, and emphasised product rather than process. The result was an increasingly pressured classroom life, permeated by an instrumental focus on pupil performance.

In seeking to understand teachers' different responses to recent policy initiatives and the significance of these differences, the issue of professional motivation is crucial. We documented the gradual movement from a covenant-based professionalism, linked to *intrinsic* satisfaction, to a contractual, performance-based motivation, driven by the demands of external accountability and assessment. We hypothesised that this is likely to lead to a decline in teachers' sense of moral, self-imposed accountability and commitment.

Review

Five years after our final round of data-gathering, the pressure on teachers to enhance pupil performance has, if anything, intensified. The New Labour administration has introduced National Literacy and National Numeracy Strategies which specify curriculum and pedagogy at the level of the classroom lesson. Whilst measured standards in these narrow performance areas has continued to rise, there is a national crisis in teacher recruitment and retention. Some grants for students in training have been provided and the volume of recruitment into primary education is a relatively minor problem. However, quality is an issue and many intergenerational families of teachers no longer recommend the profession for their children. Although salaries have increased, very high proportions of qualified teachers of working age remain employed outside education and are reluctant to resume teaching. Access to early retirement has been made more difficult because of the scale of the professional outflow. Schools are severely pressured to find occasional staff for short-term cover.

The second fuzzy generalisation concerns pupils.

If pupils are strongly constrained in what they do in school, they are likely to become disenchanted and this probably affects their motivation and commitment to learning.

Pupils and the curriculum

Despite the 1988 Education Reform Act's intention that a 'broad and balanced' curriculum should be provided, the initial decision to set up a ten-subject curriculum was defeated by complexity, subject-based overprescription, lack of time and priority given to the 'basics'. Integrated topic work waned and single subject teaching grew. There was a considerable increase in whole-school curriculum planning – particularly for subject progression. For the PACE pupil sample, schooling remained focused on the basics of reading, writing and Mathematics. English and Maths remained dominant in all six years of their experience. Writing was a major pupil concern throughout, and was generally disliked. Pupil accounts of subjects in the arts and humanities reinforce those of teachers in documenting a squeeze on available time. Indeed, pupils reported that there was 'not much' or 'no' choice of curriculum activity, and the evidence suggests that teachers' curriculum control strengthened over the period of study as they strove to comply with external requirements. We found that pupils became increasingly aware of the weight of subject content, the pressure to perform and received a passive experience 'though sitting, listening and writing rather than through activity'. We looked carefully at how children evaluated the curriculum and at the criteria that they used. Overall curriculum dissatisfaction was clear, and pupils appeared to favour those subjects associated with physical and expressive activity, entertainment, little demand for writing and reduced assessment pressure. An interesting finding was that their success in a subject did not necessarily mean that pupils liked it. Children would work at a subject despite their lack of motivation, knowing that a good result was expected of them – but many were anxious to minimise effort when they could. Even where a subject was deemed to be 'interesting', the way it was taught and experienced could undermine motivation. Low achievers felt particularly exposed by some subjects which they found confusing or hard to understand, or in which performance was categoric and public – such as Mathematics. They often preferred the fun, activity and less exposing nature of PE or the relative security of drawing.

Pupil perspectives of pedagogy

Pedagogically, whole-class interaction in the 1990s was double that of the 1970s, and teacher time spent on instruction rose dramatically, as did the proportion of closed questions used. Setting and new forms of attainment-based group work developed. The perspectives of the children indicate that classroom frame gradually tightened over the period of study. Teacher control was consistently strong and pupils reported very few opportunities in which they could exercise autonomy. Indeed, although many children liked the idea in principle of being able to choose things for themselves, the evaluative context of classroom life led most to accept and prefer high levels of teacher guidance and control. The reasoning seemed to be that: 'you've got to do something, but you might do it wrong and get told off or have to start again. So, you might as well just do what she says from the start'.

Children were asked for their opinion on teacher intentions, but commonly adopted the relatively passive stance that decisions on the sequence of things to be learned is something that is decided *for* them and done *to* them. Where pupils did express a view, it was often vague and seemed based on general inference rather than on explicit knowledge. They seemed to lack a language for expressing or discussing such issues. Nevertheless, pupils felt that their relationships with teachers were generally good, indeed many enjoyed their interaction – particularly when occasional joking , sparring and 'having fun' formed a part. Almost all the children were accepting of teacher authority through most of the primary school years though, towards the end, girls became more ambivalent and some boys began to explore more 'anti-school' identities. Our annual interviews and observations showed how children learned to strategically manage their relationships with teachers. By age 11,

many were able to skilfully detect teacher mood and intention, and negotiate accordingly. Some however, continued to lack such insights or skills.

Pupil perspectives of assessment

Pupils consistently perceived assessment as a summative activity and applied associated criteria of neatness, correctness, quantity and effort. Low attainers were particularly concerned with correctness and with the amount of work completed, whilst high attainers tended to focus on the effort they had made. However, in both cases the criteria used failed to attend to the inherent qualities of the work produced. Routine classroom assessment drew attention to surface features of tasks and of learning.

SAT testing at age 7 and age 11 appeared to have had a significant effect on perceptions, with children increasingly feeling the salience and significance of such testing. We found evidence that children became less positive in self-assessments of their own capabilities, and became more likely to displace responsibility by attributing success or failure to innate characteristics. As they grew older, the children's feelings of anxiety developed further as teachers increased the amount of routine testing. Additionally, they often felt uncertain and vulnerable when ambiguous classroom tasks were combined with a high-stakes, categoric assessment climate. The children believed that SATs were important for their imminent transfer to secondary school and their likely forthcoming placement into classes and sets. Many children were aware of the categoric and differentiating nature of the SATs, and regarded them as a form of 'official' judgement on their learning. Some, particularly lower attainers, found this very stressful, and the discourse of 'levels' was strong. Their normal sources of support, teachers and peers, had been withdrawn and, left to their own devices, many struggled. They were then particularly concerned to avoid humiliation with their peers from being labelled as a 'failure'. Many of such children simply wanted to forget about the tests, whilst some others began to generate explanatory or face-saving accounts. Higher achievers were more positive. Many benefited from support both at home and school, and they were more likely to have their efforts reinforced by their peers. Teachers often tried to offset the risk of personal hurt by encouraging children to 'simply do your best'. However, this was not enough to mask the very different experiences of high and low attaining pupils. Whilst the teacher's rhetoric was one of equal valuing of each child's personal effort, the children were in no doubt at all about who was successful and who was likely to 'fail'. Low achievers felt helpless in the face of the tests. The process was socially, as well as academically, differentiating.

Review

We analysed our data-set as a whole to highlight the key issues for children in relation to their learning. Unfortunately, for most of the time, these factors seemed to work against the generation of positive engagement and intrinsic motivation. Pressure of time was regularly identified as a problem in 'getting really interested' whilst assessment often created stress. The combination of ambiguity and assessment in respect of many classroom tasks also generated a sense of risk for pupils. Classroom noise was identified as a source of distraction, and the classic contrast between 'boredom' and 'enjoyment' was much in evidence. Children's explanations for classroom distraction suggested that the pressures of time, ambiguity, uncertainty, risk, noise, and boredom accumulated to produce conditions in which distraction was used as an 'escape'. Despite, or because of, the pressures of the classroom, pupils felt the need to break off from their work from time to time. A broad overview of the PACE data on pupils suggests that many they were playing the system, were reserved, bored, risk-averse, and shy of full engagement in learning. Our pupils, supported by their peer culture as a whole, appeared to have learned to hold back. They thus avoided being portrayed as a 'keener', 'swot', or 'teacher's pet', but they also failed to maximise their learning opportunities.

Conclusion

So is English primary education becoming more 'effective' but less personally fulfilling for teachers and pupils? Meeting more defined targets, but less broadly educational? Enabling pupils to raise SAT grades but undermining commitment to lifelong learning?

Indeed, is it even possible that a new meshing of teacher and pupil strategies could become institutionalised around mutual instrumentality? Such thinking causes recall of Etzioni's typology of compliance. In this analysis, 'moral compliance' was based on intrinsic acceptance of purposes and value concerns (a well documented position of many English primary school teachers in the past). 'Calculative compliance' was based on extrinsic judgements of personal interests, whilst 'alienative compliance' is reluctant and based on a powerlessness to resist. Is the PACE data an illustration of the transition from moral to calculative and alienative forms of compliance for both teachers and pupils? We have to be careful in settling on this simple conclusion for, whilst we can track teacher data from before

and after the Education Reform Act, we lack comparative pupil data of sufficient quality. Nevertheless, the weight of evidence is highly suggestive.

So what is the Best Estimate of Trustworthiness (BET) for the fuzzy generalisations that *if teachers or pupils are strongly constrained in their work or learning, then they are likely to become disenchanted*?

Of course, any such statements must be culturally located and would have to be interpreted with care. Among the key issues would be the meaning and interpretation of 'strong constraint' within schools and classrooms. In some societies, such control may be expected and teachers and children may have been socialised into acceptance (France?); in others, the culture may encourage a greater expectation of independence (Denmark?). A key variable would thus relate to the cultural reference points of teachers and children.

A further significant variable is likely to be the structural position of each teacher in terms of their career and of each child in terms of success and failure within the classroom system. Experienced teachers were far more disenchanted by the English school reforms, with newly trained teachers seeming more compliant. In the classroom, successful children appeared to retain their motivation more effectively than those who experience failure.

Having offered these important qualifications, my BET is that the motivational concerns raised by the PACE project are sufficiently fundamental to be at least worthy of the attention of governments or policy-makers in any country where a national education system is being introduced. This is not a strong claim to a 'truth', but it is a claim to have documented something which indicates a potential problem which could be avoided. In particular, we know that teaching is a subtle, interpersonal activity and that learning calls for challenging cognitive, emotional and social adjustments. Education, in other words, concerns human agency. The most effective national systems will work with the flow of such agency, as embedded in and mediated by available cultural resources.

In my view, despite its many successes, the present English system reflects a number of misjudgements where political ideologies or impatience created educationally inappropriate requirements. Fortunately, the proposition that things can always be improved is also a good BET, and it is to be hoped that adjustments will be made in the future.⁹

Paper 4: MOTHER'S EDUCATIONAL LEVEL AND PARENTAL INVOLVEMENT IN CHILDREN'S EDUCATION

Anne West

I directed a research project funded by the Economic and Social Research Council (UK) concerned with parental choice, involvement and expectations of achievement in school. One of the key issues addressed related to the choice process and how parents are involved in their children's education in and out of school. Differences between parents were also examined. Prompted by an interest in the use of mothers' educational level as an independent variable in studies by French Ministry of Education researchers, the research not only examined differences between parents with children in private and state (public) schools and between parents from different socio-economic groups, but also explored the use of mother's educational level as a predictor variable. Based on the analyses undertaken my colleague Philip Noden and I developed a fuzzy generalisation, namely that: *mother's education than social class*.

Preamble

We make the fuzzy prediction that: *Mother's educational level may be a better predictor of parents' involvement in their children's education than social class*. This paper represents a justification for that statement.

The research

In an empirical study investigating parents' involvement in their children's education, we tested two hypotheses, that:

- there would be differences in relation to parental involvement in education depending on the social class background of the families concerned; and
- mother's educational level is a more valid measure than social class given the growing moves away from traditional household types and the fact that educational levels are more consistent over time.

It should be noted that parental involvement was not the only focus of the study and, consequently, that the research methods, including the recruitment of a sample of parents, were not selected solely with these hypotheses in mind.

The research was based primarily on interview data collected from parents of children aged 10 to 11 years of age. The target children were from 19 schools; the schools comprised 16 state primary schools and three private preparatory schools. The state schools were in three local education authorities (LEAs), one in outer London and two in inner London. In the inner London LEAs, the state primary schools were selected in conjunction with LEA officers or inspectors. They were asked to select schools that would represent the school population in the LEA in terms of its social and ethnic composition and provide a geographical spread. In the outer London LEA, schools were selected on the basis of geographical location. The private schools were selected using the Independent Schools Information Service directory of independent schools. They were in the geographical vicinity of the state schools.

Headteachers of the schools that had been selected were approached by the research team and asked to suggest the names of six girls and six boys in year 6 (age 10 to 11 years of age) representative of the different abilities, social, ethnic and family backgrounds at the school. These parents were contacted by letter and asked to return a slip with their name, address and telephone number if they wished to be interviewed. This 'opting-in' method was considered to be an appropriate one as it yielded a representative sample in previous research carried out by one of the authors (West & Varlaam, 1990). In the present study, some headteachers wanted the research team to contact all parents in year 6, so this was offered as an alternative method for recruiting parents. It is important to note that unlike the research carried out by some other researchers, we were *not* provided with the names or addresses of parents by the schools concerned.

The achieved sample consisted of the families of 107 children. Over three-quarters (78%) of the families had children at primary schools in the state sector and around a fifth (22%) had children in private preparatory schools; this compares with around ten per cent of pupils who attend private schools in London and South East England. This over-representation of the private school sector was a deliberate decision made in order to allow for comparison between parents using the private and state sectors. The sample, cannot, however, be considered to be representative of the overall school population.

Across the sample, just under half of the target children were girls (47%). The mother was interviewed in 64 per cent of the families, the father in 10 per cent, and both parents in 23 per cent of families (in 3% of cases another member of the family or the child's guardian was interviewed). The proportion of mothers who were

interviewed alone is somewhat lower than in other research studies focusing on parental involvement in education (e.g. 81% in the study by Hughes et al. (1994)).

Overall, there was a reasonable representation of parents from different family, social, educational and ethnic backgrounds - especially given the over-representation of parents with children in the private school sector, and the inclusion of parents living in a prosperous area in outer London. In terms of the children's ethnic background, around two-thirds were classified by their parents as being 'white'. The equivalent percentage for Greater London (inner and outer) state schools was 61 per cent (London Research Centre, 1997). Our target children were thus not atypical of the London state school population in this respect. However, there were very few families from partly skilled and unskilled social backgrounds.¹⁰ This may be as a result of parents 'opting in' to the study (unlike the study carried out by Hughes et al., 1994 for example). Moreover, it is likely that parents who had an interest in the education of their children were more inclined to respond to the letter that we sent to them. Thus the sample must be considered one that was 'active' in terms of involvement in their children's education.

Analysis of results: social class, mothers' educational level and involvement

We found no statistically significant differences between parents' involvement in their children's education in terms of social background. This may be because the parents in the sample were all what we have called 'active' parents as far as involvement in their children's education is concerned and that this is a crucial factor. It may also be because of the nature of the sample, which contained few families in partly skilled and unskilled social classes. Another possible explanation is related to the lack of sensitivity of the social classification system for women's occupations that were used when the natural father was absent. We faced difficult decisions, in conducting this study, as to whether to include the occupations of step-parents and parents' partners in determining household social class (we decided in fact only to focus on the natural parents' occupations). Indeed, the hierarchy of criteria that were adopted in allocating social class gave rise to several anomalies.

To take one example, several of the families participating in this study included a father in a skilled manual occupation and a mother in a clerical - non-manual - post. The use of a class dichotomy distinguishing non-manual social classes from manual social classes in the situation of parental separation (with the child subsequently staying with his or her mother) results in the child moving from a lower (manual) social class to a higher (non-manual) social class. Thus separation would, paradoxically, be associated with *upward* mobility.

Whilst we found no differences between parental involvement in terms of social class, we did find differences in relation to the mother's educational level. When we focused on children in the state sector, we found that a mother's level of educational qualifications was associated with who attends open evenings and who has informal discussions with teachers. We also found that children with more highly qualified mothers were significantly more likely to have used workbooks at home and to have had private tuition than the children of mothers with lower levels of educational qualifications.

Thus the children of more highly qualified mothers (those with GCE A levels¹¹ or above) were significantly more likely to have used workbooks in English than other children (71% versus 46%), and also to have used workbooks for mathematics (69% versus 46%). In addition, significantly more children with highly qualified mothers than those with less highly qualified mothers (52% versus 17%) had been taught by a private tutor.¹²

As noted elsewhere (West et al,1998) the results from this study point to more highly educated mothers trying to ensure that their children's chances of success in the educational system are increased. The implication is thus that these mothers perceive that there are benefits to having higher levels of educational qualifications - that they themselves already have and that they have the capacity to contribute to those benefits. Their own cultural capital and often financial resources mean that they are in a position to seek to maximise their children's chances of educational success.

Fuzzy prediction

On the basis of this research we put forward the fuzzy prediction that: mother's educational level may be a better predictor of parents' involvement in their children's education than social class.

How does it stand against the characteristics that Michasel Bassey has suggested in his paper?

• Tentativeness

This fuzzy prediction is necessarily tentative. As noted above, this is primarily because it derives from a research study based on a sample that was not representative – particularly in terms of occupational status – of the parents of school age children in England, or even London. In the light of this, the sample of parents must be considered to be one that was 'active' in terms of involvement in their children's education.

• Generalised to an identified population

It is probably reasonable to say that the findings from our research study are generalisable to a population of parents who are 'actively' involved in their children's education.

• Short and memorable

The fuzzy prediction is short and, we believe, memorable.

• Written in user-friendly language

Hopefully the language in which the fuzzy generalisation is written is 'user friendly'.

• Convey a worthwhile idea

The idea being conveyed is not only worthwhile but probably important from a research perspective given changing family structures and paradoxes with the use of measures of social class in relation to women's occupations. In our view, the use of mothers' educational level as a predictor of parents' involvement in their children's education is one that needs to be compared with more traditional socio-economic indicators by educational researchers in the UK and in other countries where it has not traditionally been used.

Best Estimate of Trustworthiness

In our view, it is not possible to give a quantitative 'best estimate of trustworthiness' without further empirical research. In short, more studies need to be carried out collecting data on both mothers' educational level and social class. A measure of mothers' educational level may prove to be a particularly valuable one given the problems associated with social class; moreover, it has a degree of 'face validity' particularly given the findings of research conducted elsewhere. In the US for example, in the National Assessment of Educational Progress survey, students in grades 8 and 12 who reported higher levels of *parental education* had higher average reading scale scores (Donahue et al., 1999).

Paper 5: DISCUSSANT'S WRITTEN COMMENTS

Robert Stake

It. is seldom we have papers on such a complex matter where the issue is put forward so clearly. The issue is summary representation of findings from social research. In presenting three examples, Sue Hallam, Andrew Pollard, and Anne West and Philip Noden raised additional substantive and methodological issues, but did so with the intent to claim that each of their dissimilar studies could profitably be summarized in a fuzzy prediction or two. I will take the position that the form of fuzzy prediction offered by Michael leaves too much unsaid.

We could spend some time generally deploring the appetite for generalizations. We could note that William Blake said: "To generalize is to be an idiot, to particularize is the lone distinction of merit." We could note that case study became a legitimate and useful form of educational research, as Michael summarized in his 1999 book, partly because we concentrate on the particularity of the case.

But idiots though we may be, we all constantly generalize. The reason we do research is partly to improve our generalizations. And that is one of my points. We seldom make generalizations *de nova*. What we usually do is confirm or modify existing generalizations to give more or less heed to the treatment or the conditions of the study.

Take Andrew's study. The key finding of his analysis of PACE Project data, as presented in the form of the fuzzy generalizations was:

"If teachers are strongly constrained in their professional work, they may become disenchanted."

That prediction suggests an applicability in Azerbaidzhan and Malaysia as well as in Britain. But to be so universal, Michael has it take the shape of a weak generalization: "They may become disenchanted." Doesn't it make more sense to summarize Andrew's findings like this:

"Teachers in England are being increasingly constrained as professionals. We found in our study that that is causing them to become disenchanted with their work."

Such a conclusion invites the readers to generalize if they please, in England or Malaysia, based, I presume, upon their perception of the similarity of terms and conditions.

It is likely that readers already have some opinion of constraint on professionalism and disenchantment in the

workplace. Each of them is working from previous experience. They probably <u>already</u> believe that constraint may cause disenchantment, so the study helps if it moves thinking away from "may" on to "is likely to," as Andrew actually did.

Isn't it true that the only situation where "X <u>may</u> cause Y" is a valuable finding, is where the readers already expect that "X <u>will not</u> cause *Y*?" Listen:

"Hey, constraint may cause disenchantment."

"That's hard to believe. We've never seen anything like that around here."

"No kidding. Andrew Pollard's research shows that it may happen."

"Wow! Blows my mind."

But when readers, including theorists, already think it possible, the verb "may" is a wet noodle.

Let's try Ann and Philip's fuzzy prediction:

"Mothers' education level may be a better predictor of parent involvement in their children's education than social class."

This is a more informative conclusion, valuable if the reader has a strong expectation of social class as a predictor of involvement, but less if not. Confirming that something may happen is not of much help, if we already believed it.

Ann and Philip didn't really study what may or may not happen. What I read as the summary for Ann and Philip really was:

"In these places, the greater the educational level of the mother, the greater her involvement in the education of the child."

That is a substantial finding. It was watered down, I think, by converting it to a fuzzy prediction.

I am guessing that Michael went searching for a different research summary because he was dismayed by the immodesty we researchers show when we compose formal scientific generalizations to conclude quite limited studies. Does the generalization apply to teenage mothers, to queens, to foster parents, to working mothers'? Each needs its consideration before we modify grand theory. Greater modesty is warranted.

But a better way to be helpful is to steer away from science, to steer away from grand generalization altogether.

Rather than use words like "may be related to", rather than make it fuzzy, I think we should assist readers in applying the findings to their situation. We should help them make their own petite generalizations, specific to the form of treatment and range of conditions experienced in their settings.

How we do that is partly by describing the persons, places, happenings of the research in sufficient detail so that the readers can reason or intuit the applicability of the vicarious experience to the population of experience they individually have already experienced.

I should not have implied that Michael would stop at generalizations in the form of X may influence Y. With the concept of BET, he has taken steps to help estimate the likelihood of the influence. But still I object.

What I am objecting to is not vagueness but the choice of ways to help educational practice. policy, and theory. Michael encourages us to increase attention to generalizations, universals, and away from the particulars of what was actually observed. But as I see it, organizing our thinking by alluding to vague populations is one of our weakest habits. Prediction isn't our business.

If Michael is right about all us researchers yearning to produce predictions, then heaven help us. because we will further oversimplify education in our effort to make it predictable.

Generalizing is a grand human skill. I don't think practitioners, policy people, and theorists do it better by starting from delivered generalizations rather than from vicarious experience and the particulars of research findings. So researchers arise, let's particularize more and generalize less.

Michael Bassey

First, I would like to express my gratitude to Sue Hallam, Andrew Pollard, Anne West and Philip Noden for joining me in this AERA presentation and responding to the ideas of fuzzy prediction and best-estimate-of-trustworthiness in terms of their own substantial studies. Their support has strongly encouraged me in the belief that these concepts are methodologically significant.

Second, I would like to thank Bob Stake for his lively contribution to the discussion and take the opportunity of this endnote to respond briefly to some of his points. Flippantly I note that a 'wet noodle' is more easily eaten than a dry noodle - and the intention of fuzzy predictions and BETs is to assist the would-be users of research to digest research findings!

I'd like to focus on Bob's account of Andrew's findings, which he would like to see stop at the statement: 'Teachers in England are being increasingly constrained as professionals. We found in our study that that is causing * them to become disenchanted with their work'. [At the asterisk I would want to add 'many of'.] This is, of course, an empirical statement accurately based on the research. When it is developed into the fuzzy prediction, 'If teachers are strongly constrained in their professional work, they are likely to become disenchanted ...', Bob objects on the grounds that it implies universality. This is the point of generalisation but, unlike earlier concepts of generalisation, the certainty of its applicability is removed by introducing fuzziness. This is then something that is directly applicable to the concerns of educational policy-makers and, when linked to a BET, can enable them to ensure that their policy decisions are research-informed. As Andrew points out, such statements must be culturally located and interpreted with care - so policy-makers in Azerbaidzhan or Malaysia need someone to give them a local best-estimate-of-trustworthiness for the fuzzy prediction. When Bob writes 'Hey, constraint may cause disenchantment' he misses the fundamental point that this arises from a five year in-depth study, not someone's casual thoughts on the backseat of a bus. Fuzzy predictions are only of value if supported by substantial research and likewise the credence of a BET must depend upon the experience and wisdom of whoever puts it forward.

I am with Bob in his view that we must focus on the particulars of what we are observing. That is what I mean by stressing the importance of substantial research. But I want to go further - making predictions - and that is where he and I disagree. I am sympathetic to the requests of policy-makers and practitioners who ask that research tells them 'what works?', but I caution them that they should ask, 'what *may* work - *and in what circumstances*?'

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⁷ This research was funded by ESRC and undertaken at the Institute of Education, University of London by Peter Mortimore, Sue Hallam, Judy Ireson, Sarah Hack and Helen Clark.

⁸ See Ireson and Hallam (2001)

⁹ The three phases of this project occupied a substantial team of researchers from its initial funding in 1989 until the completion of the latest two books in 2000. Co-directed throughout by Andrew Pollard and Patricia Broadfoot, the team at various times included Paul Croll (co-director Phase 1), Marilyn Osborn, Dorothy Abbott, Elizabeth McNess, Pat Triggs, Edie Black, Jenny Noble and Mike Taysum.

The most recent books that report these findings are: Osborn et al (2000), Pollard et al (1994), Pollard et al (2000), Croll (ed) (1996).

¹⁰ Unfortunately, no national or regional data on the social class or family composition of schools in England are collected by GB Department for Education and Employment, so it is not possible to establish the extent to which our sample is representative of the school population as a whole. However, we do know that in 1998, 28% of pupils in London primary schools were eligible for free school meals (an indicator of poverty); in this sample, our estimate is that 11% of children would have been eligible for free school meals.

¹¹ General Certificate of Education (GCE) Advanced (A) levels are generally taken at the end of upper secondary education and are the normal entry requirement for higher education in England, Wales and Northern Ireland.

¹² The comparable figures for parents from non-manual and manual social backgrounds were: 59% versus 59% for use of workbooks in English; 61% versus 50% for use of workbooks in mathematics; and 41% versus 25% for having been taught by a private tutor. None of these differences between parents from different social backgrounds reached statistical significance.

¹ Each year the American Educational Research Association (AERA) invites the British Educational Research Association (BERA) to contribute a symposium at its annual conference. Michael Bassey gave the lead paper at the session on 12 April 2001 in Seattle and was supported by three colleagues (Sue Hallam, Andrew Pollard and Anne West) illustrating this approach to generalisation from their own research work. Robert Stake was discussant and the symposium was attended by about 70 people.

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