Research methodology and educational psychologists as scientist-practitioners: The contribution of Professor Andy Miller

Norah Frederickson

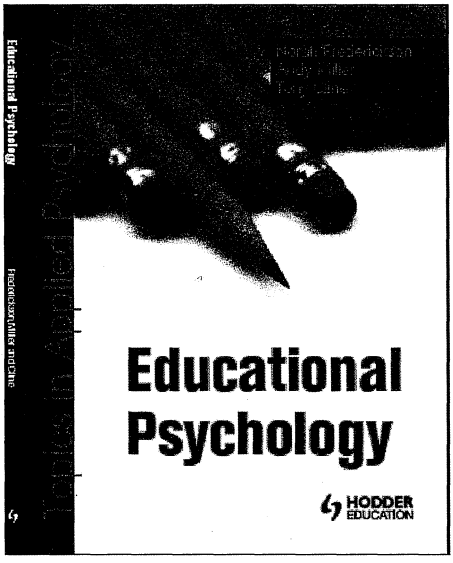
THE INVITATION to offer a perspective on Andy Miller's contribution to research methodology in educational psychology provided a welcome opportunity to review his body of published work over the last 30 years. I consider myself in something of a priviledged position, both in having been given this stimulus to reread many of Andy's papers, but also in having enjoyed a ringside seat over the last 20 of those 30 years as a regular co-author with Andy. Our first joint publication, back in 1988, reported on the development of a set of resources for use by educational psychologists in planning their professional development (Watts et al., 1988). Our most recent, but hopefully not last, publication has a different target audience, third year psychology undergraduates (Frederickson, Miller & Cline, 2008). I propose to start with this most recent publication in illustrating one of the core characteristics of the contribution that Andy has made, namely its breadth. Even readers who consider that they are well acquainted with Andy Miller's work should prepare themselves to be surprised by the range of different topic areas and methodological approaches that feature in his research. In many cases breadth and depth are antithical. This is not the case in Andy Miller's work and indeed the second key characteristic which will be highlighted in this paper is the methodological rigour with which his research has been conducted. The final point which I will highlight concerns appropriateness. Andy is known as a champion of the application of mixed research methods in psychology, not because it is inclusive or indeed fashionable, but because it is necessary. His breadth of research focus and his committment to rigorous methodology has led him to an understanding of the importance of 'fit for purpose' methodologies which still eludes many with narrower horizons and less confident mastery of the technical skills involved.

Starting then with the breadth of topics in educational psychology in which Andy has conducted research. Figure 1 lists the chapter headings of the four chapters written by Andy in our most recent joint publication, along with Tony Cline. Looking at the titles of these chapters most readers who are at all acquainted with Andy's work will not be surprised to see that the first two focus on challenging behaviour in school and behavioural approaches to classroom management, possibly the aspects of educational psychology practice, where Andy's contribution is most widely known. However it is possible that the third and fourth chapters listed present more of a surprise, particularly to younger members of the profession.

The chapter on school phobia and school refusal has its roots in Andy's first publication (Galloway & Miller, 1978). This publication reported a single case study of an 11-year-old boy who refused to go to school on certain mornings. Interviews with the boy and his mother revealed that he was fearful of showering after games and physical activities. The paper describes the programme of graded exposure, using imagined shower scenes and reciprocal inhibition training in vivo, which Andy implemented in consultation with David Galloway. This programme enabled the boy to improve his attendance and after seven treatment

© The British Psychological Society

Figure 1: Andy Miller's chapter's in a 2008 undergraduate textbook in educational psychology.



- **Challenging behaviour in school: Who is to blame ?**
- **How ethical are behavioural approaches to classroom management ?**
- **School phobia and school refusal: Coping with life by coping with school ?**
- **Raising educational achievement: What can instructional psychology contribute ?**

sessions he was successfully taking showers at school. This is a paper that should be of very considerable interest to the many educational psychologists currently considering increasing their individual intervention practice.

Least readers be misled into imagining that the early years of Andy's career as an educational psychologist were characterised by ample amounts of time to devote to work with individual children, the research work which underpins the last chapers listed in Figure 1, on instructional psychology, quickly dispels that misapprehension. This paper (Miller et al., 1985) described a piece of work which was directly motivated by the inability of a small team of psychologists to assist teachers in promoting the learning of all of the children in the area about whom they were concerned. The programme involved training teachers in direct instruction and precision teaching, using methods to address each of Bruner's (1966) three modes of knowledge representation: enactive, iconic and symbolic. The educational psychologists supported teachers through the course of the training programme, as they carried out individualised interventions with pupils experiencing serious literacy difficulties. Evaluation questionnaires completed by 84 per cent of participating teachers reported the successful completion of 289 direct instruction and 187 precision teaching programmes. Over the course of a year three educational psychologists were able to support 95 children and their teachers across a large geographical area.

Andy's concern for children who have severe literacy difficulties was also the stimulus for the studies which first drew his work to my attention when I was a newly-qualified educational psychologist. His first paired reading study (Bushell, Miller & Robson, 1982) must rank as one of the most influential articles ever published in educational psychology in the UK. It played a major role in bringing paired reading, which was developed by Morgan (1976), to the attention of educational psychologists and illustrating its applicability to their professional practice. It certainly inspired me to set up paired reading programmes in my local authority

and I know it had a similar effect on many colleagues at the time. Very many services in the mid 1980s made their own paired reading videos and school library services struggled to keep up with the demands from schools involved in paired reading programmes, setting up special book boxes specifically for that purpose.

The initial paired reading study was a pre-post single group design, involving 22 10-year-olds whose reading accuracy was two years behind their chronological age at the start of the programme. Over two months they made six month's progress in reading accuracy and one year progress in reading comprehension, as assessed by the Neale Analysis of Reading Abilities. Six-month follow-up reported good maintenance overall but variability between schools, leading to a discussion about the importance of the nature of school involvement in such projects, and how this might be positively influenced. The authors also reported that the gains in reading scores were not found to be related to standard scores on the English Picture Vocabulary Test (a test of receptive vocabulary, often used as a proxy verbal IQ measure by literacy support services in the 1980s). The authors purpose in running these analyses was made clear in the reporting of the findings, namely to make the point that below average IQ should not be used as a means to exclude children from participation in such projects. Twenty years on, and with the IQ-achievement discrepancy approach to dyslexia now discredited on both sides of the atlantic (British Psychological Society, 1999; US Department of Education, Office of Special Education Programmes, 2002; Vellutino et al., 2004), it is salutory to remind ourselves that in the mid-1980s children were frequently excluded from access to specialist literacy support through the operation of criteria involving IQ cut-off scores. It is clear that the authors of this paper considered it important to provide an evidence base which prevented paired reading being similarly restricted, and in the process sought helpfully to challenge inequities in the prevailing practices of the time.

In their conclusions Bushell et al. (1982) pointed out the limitations of their study, commenting in particular on the absence of a control group making it impossible to draw firm conclusions about the effectiveness of the intervention. They did, however, draw a strikingly contemporary distinction between judgements based on statistical significance and those based on considerations of educational significance. In this regard they cited the widely held expectations that older junior school children with reading problems were unlikely to make significant progress, challenging that council of despair by highlighting what actually could be achieved in a short time and with little call on extra resources. The authors also gave consideration to the role of the EP in the project, concluding that it was actually fairly central given the delicacy of the role negotiations involved and 'the need to divert the implicit criticism of each other's abilities and attitudes, usually generated by parents and teachers when children fail to make progress in reading' (p.12).

It is common for educational psychologists reporting on such a study with such limitations, to conclude by recommending that further research should be undertaken, preferably involving a control group and other features of more rigorous design. What is very much less common is to find that authors subsequently take their own advice and carry out the study recommended. The second paired reading study (Miller, Robson & Bushell, 1986) was a double blind controlled trial of paired reading. It stands as a rebuke to those who claim that such research cannot be done in the normal run of educational psychology practice and instead illustrates that with skill, imagination and commitment indeed such rigorous research can be done. The study initially recruited 91 children whose reading accuracy was at least 18 months behind their chronological age. They were divided into two groups of approximately equal numbers

across the 13 schools involved in the research. A wait list control group design was utilised where one group of 46 children and parents were invited to start in January (33 of whom took up the invitation), while 45 were invited to start in March (21 of whom took up the invitation). The second group served as a control for the first during the period of January to March. While the use of no-intervention control groups clearly raises ethical issues, the use of no control group is likewise problematic as it is often difficult to ascertain whether just as good progress would have been made with nornal school provision, rendering unjustifiable the time and resources consumed by the intervention. A wait list control group design overcomes both sets of disadvantages as it allows the 'value added' of the intervention to be ascertained, ensures that the control group receives it if it is effective and, if it is not effective, allows an alternative approach to be identified for the second group of children, allowing an iterative programme of development and research to occur, from which all might ultimately benefit.

The double blinding in the Miller et al. (1986) study was achieved by involving the local authority advisory teaching service in conducting the assessments, using different forms of the Neale Analysis of Reading Ability, randomised across time. The teachers did not know which children were participating in the intervention and the children were not aware that their meetings with the advisory teaching service members related to their participation in the paired reading study. The findings of the two-way mixed analyses of variance conducted on the scores from the Neale Analysis Reading Ability indicated that the paired reading group improved significantly more than the control group on reading accuracy but not on reading comprehension (although the gain scores were in the predicted direction). In their conclusions the authors suggested that the comprehension gains commonly reported from paired reading studies may well reflect artifactual effects of repeated use of the Neale over a period of eight weeks (something that could only be properly ascertained through the use of a control group).

Before leaving the chapter of Andy's career focussed on paired reading, one further study requires attention as it illustrates very nicely the third characteristic of his work: appropriateness. As the practice of paired reading spread a number of educational psychologists began to question whether the specific techniques embodied within paired reading (simultaneous and independent reading, the self-correction procedures, etc.) were necessary to the success of the intervention or whether more generic approaches focussing on the relationship between the child and the parent might not be as successful. In one interesting study, for example, Lindsay, Evans and Jones (1985) examined the effects 'Relaxed Reading' – child and parent practised reading together where the parent adopted a non-specific warm, positive and rewarding approach. Rather than reacting defensively or launching a counter attack, Andy took such questionaing seriously, publishing an article in 1987 entitled 'Is there still a place for paired reading?' where he set out to investigate the circumstances under which this approach may and may not be the technique of choice. He examined a range of variables (through collecting observational data on home visits) in seeking to establish the relationship between characteristics of the technique and reading accuracy gains). Those that emerged most strongly were the quality of independent reading and the percentage of words read independently. He concluded that paired reading was likely to be the most appropriate technique when the parent finds it difficult to hold in check their negative reactions when the child makes errors in indepent reading. The specific correction procedures in paired reading appeared to prevent such parents engaging in behaviour that, albeit sometimes well-intentioned, would certainly not be experienced by the child as warm, positive or rewarding.

Andy's extremely impressive work in the area of paired reading led to his involvement in the UCL phonological skills research seminar group and the production of the phonological assessment battery (Frederickson, Frith & Reason, 1996), the first standardised assessment of phonological skills available to educational psychologists in the UK. In addition to his overall contribution to the work of the group Andy and Simon Gibbs were responsible for the development of the battery's test of rhyme awareness (Gibbs & Miller, 1996).

Given his involvement in the 1980s in highly quantitative studies, including a double-blind control trial, it is interesting that to many in educational psychology today Andy Miller's best known methodological contribution has been in relation to qualitative research methods, in particular bringing grounded theory to educational psychology. Andy's fascinating exposition of the use of grounded theory to study the school system and teacher culture issues surrounding the involvement of educational psychologists in working with teachers on behaviour programmes for pupils experiencing social, emotional and behavioural difficulties (Miller, 1996) is probably his most highly cited work. In talking and writing (Miller, 1995) specifically about grounded theory at the time, Andy brought a clear, comprehensive but readily accessible account of the methodology to the profession of educational psychology. This had the effect of greatly stimulating its use by educational psychologists. Andy's description of the approach as one which was 'real, deep and hard' nicely encapsulates its ability both to capture the specific and detailed characteristics of contexts within which educational psychologists were working while at the same time bringing to the analysis a level of rigour from which shared insight and applicable learning could follow.

It was good to see this work further developed in Miller (2003) which drew in addition on soft systems methodology, another 'real, deep and hard' approach as can be seen in this conceptualisation by it's originator, Peter Checkland. 'Systems thinking is an attempt, within the broad sweep of science, to retain much of that tradition but to supplement it by tackling the problems of irreducable complexity via a form of thinking based on wholes and their properties which compliments scientific reductionism' (Checkland, 1999, p.74). Of course, this was not the first time that Andy Miller had written about the application of systems theory to the work of an educational psychologist (Miller, 1980). Throughout Andy's career he has been interested in a wide range of approaches, appropriate to the range of issues in educational psychology practice. In recent years this has led to a clearly articulated focus on the importance of mixed methods in the work of educational psychologists, conceptualised as scientist-practitioners. In his introduction to the chapter in a book on mixing methods in psychology (Miller, 2004), he noted: *'EPs attempt to act as scientist-practitioners, bridging the gap between educational policies and practices and the research community. This chapter was therefore particularly concerned with research across this divide – the contribution to educational practice that psychology as a discipline is able to make, the potential sticking points in these applications, and the richness of research possibilities that this area of work offers* (p.188).

Andy has actually been applying mixed methods in research studies throughout his career, as these next two examples, from publications separated by 20 years, nicely illustrate. The first study (Miller & Ellis, 1980) describes a behaviour management course for a group of parents, an area of work very much on the agenda of many educational psychology services today. How many services currently though evaluate the effectiveness of such courses solely by parent completed questionnaires? Clearly parents response to the training is important, however, Miller and Ellis (1980) focussed their evaulation efforts on outcomes for individual children of changes made by parents as a result of and in the course of the training. In the current climate, with the

Every Child Matters agenda placing a very strong focus on outcomes for children, there would seem to be much we can learn from the single case experimental design adopted by Miller and Ellis to assess the outcomes for the children involved in this programme. In addition, however, to this quantitative emphasis there was a systemically orientated analysis of the broader impact of the parent training programme on the work of the preschool centre within which it was located, leading to the presentation of examples *'which illustrate ways in which the course and the everyday activities of the centre interacted, each serving to magnify the effect of the other'* (p.154).

The second example of the use of mixed methods is taken from Miller, Ferguson and Byrne (2000). The focus of study in this investigation was pupils' causal attributions for difficult classroom behaviour. Intensive small group interviews were conducted with year seven pupils using an innovative distancing technique to obtain their views on causes of difficult classroom behaviour in the primary schools they had previously attended. From the qualitative analysis of the interviews an attitudinal survey was subsequently constructed, administered to large numbers of year seven pupils and factor analysed. The four factors identified: teacher fairness, pupil vulnerability, adverse family circumstances and strictness of classroom regime contrasted revealingly with factors identified by teachers. This study was subsequently followed up by a study of parents views which received much media coverage, attracting headlines such as 'parents blame teachers for poor pupil behaviour'.

The range of methodological approaches identified in Andy Miller's work (see Figure 2) represents a tremendous resource to the profession of methodological exemplars, just as relevant today as when they were each first published. Indeed one could assemble a core course in research methods for trainee educational psychologists solely illustrated by exemplar studies drawn from Andy Miller's body of published work. That is indeed an extraordinary legacy to be leaving initial training in educational psychology as he retires as co-director of the programme at Nottingham University.

Figure 2: Methodological approaches used in the publications by Andy Miller that are reviewed in this article.

However, even Figure 2 does not of itself do justice to Andy Miller's contribution. In addition to the breadth, rigour and appropriateness that characterise his work there is, perhaps above all a drive for coherence and conceptual clarity (Miller & Leyden, 1999) that has been given particular expression in his more recent writings on educational psychologists as modern scientist-practitioners, and the dilemmas and challenges faced in this role (Miller & Frederickson, 2005, 2008). At core this involved a dual focus on understanding general process and understanding individual problems. The struggles involved in marrying these perspectives and, notwithstanding this, the desirability of a scientist-practitioner identity has recently appeared as representing an emerging international consensus. For example, Huber (2007) writing from a US perspective notes *'the scientist-practitioner model can provide a viable framework for school psychology practice by focussing on empirical evidence, incorporating a systemic, constructivist-contextualism viewpoint of knowledge with an outcomes-orientated and problem-solving approach to research'* (p.778) and *'school psychologists may find effective interventions that are based on scientific knowledge of group comparisons. However, there are individuals who do not neatly fall into certain groups and whose responses to treatments are different from the norm'* (p.785). As with so many aspects of educational psychology practice Andy Miller was there already, mapping the territory and identifying the techniques and approaches appropriate to apply to it. Always the consumate scientist-practitioner, the professional of educational psychology has much to thank him for.

Norah Frederickson

References

British Psychological Society (1999). *Dyslexia, literacy and psychological assessment.* Leicester: British Psychological Society.

Bruner, J. (1966). *Toward a theory of instruction.* Cambridge, MA: Harvard University Press.

Bushell, R., Miller, A. & Robson, D. (1982). Parents as remedial teachers: An account of a project with the parents of junior-aged failing readers. *Association of Educational Psychologists Journal. 5*(9), 7–13.

Checkland, P. (1999). *Systems thinking, systems practice: A 30-year retrospective.* London: Wiley.

Frederickson, N., Frith, U. & Reason, R. (1997). *Phonological Assessment Battery: Standardisation edition.* Windsor: NFER-Nelson.

Frederickson, N. & Miller, A. (2008). What do educational psychologists do? In N. Frederickson, A. Miller & T. Cline (Eds.), *Topics in Applied Psychology: Educational Psychology.* London: Hodder Arnold.

Frederickson, N., Miller, A. & Cline, T (2008). *Topics in Applied Psychology: Educational Psychology.* London: Hodder Arnold.

Galloway, D. & Miller, A. (1978). The use of graded in-vivo flooding in the treatment of children's phobias. *Behavioural Psychotherapy, 6*(2).

Gibbs, S. & Miller, A. (1995). The development of a test of rhyme awareness. *Educational and Child Psychology, 12*(1), 34–38

Huber, D.R. (2007). Is the scientist-practitioner model viable for school psychology practice? *American Behavioral Scientist, 50*(6), 778–788.

Lindsay, G., Evans, A. & Jones, B. (1985). Paired reading versus relaxed reading: A comparison. *British Journal of Educational Psychology, 55*(3), 304–309.

Miller, A. (1980). Systems theory applied to the work of an educational psychologist. *Association of Educational Psychologists Journal, 5*(3), 11–16.

Miller, A. (1987). Is there still a place for paired reading? *Educational Psychology in Practice. 3*(1), 38–43.

Miller, A. (1995). Building grounded theory within *educational psychology practice. Educational and Child Psychology, 12*(2), 5–14.

Miller, A. (1996). *Pupil behaviour and teacher culture.* London: Cassell.

Miller, A. (2003). *Teachers, parents and classroom behaviour. A psychosocial approach.* Milton Keynes: Open University Press.

Miller, A. (2004). Educational psychology and difficult pupil behaviour: qualitative, quantitative or mixed methods? In Z. Todd et al. (Eds.), *Mixing methods in psychology. The integration of qualitative and quantitative methods in theory and practice.* London: Hove. Psychology Press.

Miller, A. & Ellis, J. (1980). A behaviour management course for a group of mothers: The importance of the course setting for effective use of available resources. *Child: Care, Health and Development, 6,* 147–155.

Miller, A., Ferguson, E. & Byrne, I. (2000). Pupils' causal attributions for difficult classroom behaviour. *British Journal of Educational Psychology, 70,* 85–96.

Miller, A. & Frederickson, N. (2005). Generalisable findings and idiographic problems: struggles and successes for educational psychologists as scientist-practitioners. In S. Corrie & D. Lane (Eds.), *The modern scientist-practitioner in psychology.* London:Routledge.

Miller, A., Jewell, T., Booth, S. & Robson, D. (1985). Delivering educational programmes to slow learners. *Educational Psychology in Practice, 1,* 99–104.

Miller, A. & Leyden, G. (1999). A coherent framework for the application of psychology in schools. *British Educational Research Journal. 25*(3), 389–400.

Miller, A. Robson, D. & Bushell, R. (1986). Parental participation in paired reading: A controlled study. *Educational Psychology, 6*(3), 277–284.

Morgan, R.T. (1976). 'Paired Reading' tuition: A preliminary report on a technique for cases of reading deficit. *Child Care Health and Development, 2*(1), 13–28.

US Department of Education, Office of Special Education Programmes (2002). *Specific learning disabilities: Finding common ground.* Washington, DC: Author.

Vellutino, F.R., Fletcher, J.M., Snowling, M.J. & Scanlon, D.M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? *Journal of Child Psychology and Psychiatry, 45*(1), 2–40.

Watts, P., Miller, A., Frederickson, N., Myers, M. & Hart D. (1988). Planning professional development for educational psychologists 1. A framework and set of resource materials for a systematic approach. *Educational Psychology in Practice, 4*(1), 4–12.