A-level psychology teachers: Who are they and what do they think about psychology as a subject and a discipline?

Martin Rowley & Elizabeth L. Dalgarno

A-level psychology teachers (N=109) responded to a questionnaire asking about their academic background, their experience of and views about A-level psychology. Teachers were also asked about the scientific status of psychology as a discipline and about the nature of science in general. Most respondents thought that the A-level course provides students with good preparation for university but overall they tended to disagree that the A-level should be a pre-requisite for university study. A-level topic options taught least often (e.g. biological, cognitive) were amongst those previously identified as areas where incoming undergraduate students could be better prepared (Banister, 2003). Compared with previous research (Maras & Bradshaw, 2007) a greater proportion of psychology teachers thought psychology is a science but this was qualified by the belief that psychology is not as scientific as 'harder sciences' such as physics or chemistry.

Keywords: *Pre-university psychology; psychology teaching; psychology as science.*

THE Advanced Level General Certificate of Education (A-level) is currently the standard entry qualification to higher education courses in England, Wales and Northern Ireland. In 2009 almost 53,000 students sat A-level examinations in psychology, making psychology the fourth most popular A-level subject behind English, maths and biology (JCQ, 2009). The popularity of psychology as an A-level subject is remarkable given that in the UK it is not taught to students under the age of 16 years as a compulsory National Curriculum subject. It is unclear whether the absence of psychology from the core school curriculum is linked in any way to its popularity at A-level. What is clear, however, is that any subject which attracts a large number of students will also require a large number of teachers.

For psychology, the demand for teachers has been complicated by the fact that, as a non-core subject, until recently teacher training courses have not been available to graduates wishing teach psychology in schools. The introduction of Postgraduate Certificate of Education (PGCE) psychology courses in a small number of universities has meant that this situation is now changing. Historically, however, schools have had to find a way of responding to the needs of increasing numbers of students wishing to take A-level psychology. Anecdotal evidence (and personal intuition) suggests that in many schools the demand for psychology teaching has been met by existing staff members who do not have a psychology background. This may not be the case in sixth-form and FE colleges where teacher training requirements are different. This leads to a number of questions being raised about the teaching of A-level psychology. In particular: Who is teaching A-level psychology in schools? What psychology background do they have? What is their approach to psychology as a discipline? Do characteristics of school psychology teachers differ to those of teachers in sixth-form and FE colleges? These are some of the issues we ask about in the study reported here.

These are not new questions, but they are difficult to answer with certainty. It is unclear, for example, whether precise figures exist regarding the number of people

currently teaching A-level psychology in schools and colleges so accurate information about their background and training is hard to come by. Neither is it clear whether information exists about the number of students coming through each type of institution. On the other hand, several attempts have been made to examine issues relating to the teaching of psychology at pre-university level. The British Psychological Society, for example, has commissioned two reports to examine pre-university psychology. The first of these (BPS, 1992) made a number of recommendations which have subsequently borne fruit. The Society set up the Psychology Education Board to promote the study of psychology at all levels and its Standing Committee on Pre-Tertiary Education (SCOPTE) deals specifically with pre-degree psychology. The Society has also actively (and successfully) promoted both the inclusion of psychology as part of the Science National Curriculum and the provision of appropriate training for teachers of pre-degree psychology. The second report (McGuiness, 2003) focused more upon the student experience of A-level psychology and the training of psychology teachers. Overall, undergraduate psychology students reported benefiting from their A-level course although they also highlighted 'repetitions' and 'discontinuities' between A-level and degree-level study. This report also argued for an increase in the provision of PGCE places for psychology graduates (still a problem at that time) and recommended that the Society develop in-service training courses for teachers who are not graduates in psychology and those wishing to increase their knowledge of the discipline.

More recently a survey of A-level psychology teachers has been carried out at the University of Greenwich (Maras & Bradshaw, 2007). Questionnaires were sent out to schools and sixth-form colleges in the south-east of England resulting in almost 100 responses from pre-university psychology teachers. Most of these had studied psychology 'at some point' although only around 47 per cent reported having qualifications in psychology (rather than subjects 'related' or 'not-related' to psychology) and many respondents were dissatisfied with both the pre- and in-service training that had been available to them. Many teachers also commented negatively on A-level specifications, particularly in regard to their heavy content, the over-emphasis upon rote learning to pass exams and the lack of time available to teach the course. In the current study, we followed up these responses by asking teachers about their training needs as well as their views about A-level psychology.

Finally, despite the curriculum reclassification of psychology as a science, only around 62 per cent of the teachers surveyed by Maras and Bradshaw agreed that psychology is a science (although only three per cent disagreed and the rest remained neutral) which could indicate scepticism in some quarters about the scientific status of the discipline. As the researchers point out, it is worth asking whether A-level teachers' views about the nature of psychology influences their teaching and if so, whether this could affect students' expectations about how psychology is taught at degree-level. Since their study, however, a new strand has been introduced to the psychology A-level specification, 'How science works', which requires teachers to address explicitly issues around the use of scientific methods in psychology. In our survey we asked teachers their views about psychology as a science and also asked them about the nature of science in general. We were interested in the extent to which variation exists amongst teachers in their views about these issues.

A-level examination boards and topics

At the time of our survey there were five UK examination boards offering psychology at A-level although the teachers in our survey were delivering courses from just three of these: Edexcel, OCR, and AQA. Although core areas covered by the psychology syllabus have until recently been determined by the Qualifications and Curriculum Development

Agency (QCDA), historically there has been variation across boards in the topics chosen to illustrate these areas and how they are covered and assessed. Furthermore, individual examination boards have offered alternative syllabuses (for example, AQA-A and AQA-B). The A-level itself is split into the AS-level which can be taken as a stand-alone one-year course and the A2-level which builds upon AS.

Across examination boards there is a consistent pattern within each specification, with AS-level being more prescriptive about topics to be covered and with more choice at A2-level, where topics can be selected from a range of options. Examination papers at A2-level tend to require students to answer questions from more than one topic, but not from the full range of options. Therefore, although there is a range of topics available for study at A2-level, it is possible for teachers with the examination in mind to focus upon a smaller number of topics in depth. At the time of our survey, for the AQA-A syllabus A2 topic options were selected from five areas: social, physiological, developmental, cognitive and comparative psychology. For AQA-B, the areas were health, child development, atypical and contemporary issues. For the Edexcel syllabus the areas were: health, crime, education and sport psychology. For the OCR syllabus they were health, crime, child, sports and exercise psychology.

Method

In recruiting our participants we aimed to survey a representative group of A-level psychology teachers. During the 2008–2009 academic year schools and colleges in England (initially in the West Midlands but some chosen randomly from a wider area) were contacted by telephone or e-mail in the first instance and asked for permission to speak to 'the person responsible for the teaching of A-level psychology'. We described our questionnaire to this individual who, if agreeing to take part, advised us how many questionnaires to send to their institution. Questionnaires were sent out either by post to the contact person (who specified the number required) or, where supplied, to the e-mail addresses of individual members of staff. Paper copies of the questionnaire were sent out with return envelopes. Electronic versions of the questionnaire were returned by e-mail attachment to the second author who then saved the questionnaires to a central file and deleted the sender's e-mail address. In total, 89 teachers from 47 schools and colleges were recruited in this way. We also advertised the questionnaire on the website of the Society and a further 20 responses were received by e-mail. It was not possible to identify individual psychology teachers from their responses. Our questionnaire was organised into three sections in order to gather information about the psychology teachers and their teaching, their views about A-level psychology, and their beliefs about the scientific nature of psychology as a discipline.

Psychology teachers and their teaching.

A-level psychology teachers

Amongst our final sample of 109 A-level psychology teachers there were 23 males and 86 females whose mean age was 39 years and 7 months (Range 23 to 61 years). There was a fairly even spread of ages in the sample, 31 per cent were aged from 20 to 30 years, 21 per cent from 31 to 40 years, 26 per cent from 41 to 50 years, and 22 per cent were 51 years or older. A range of psychology teaching experience was also represented with 25 per cent having three years or less experience of teaching psychology at A-level, 46 per cent having between four and 10 years' experience, and 30 per cent having over 10 years' experience. Almost two-thirds (N=70; 64 per cent) of our sample were teaching in schools with the rest teaching either in sixth-form colleges or in Further Education (FE). Around 95 per cent of our sample held a teaching qualification, with 71 per cent reporting that they held a Postgraduate Certificate in Education (PGCE). A similar proportion of teachers in schools and colleges held a PGCE.

Around 81 per cent of those who took part were qualified to graduate or postgraduate level in psychology. However, we found that a larger proportion of those teaching in schools were without at least a degree-level qualification in psychology (20/70) compared with teachers in sixth form or FE college (1/39): $\chi^2(1)=10.099$, $p=.001$, $w=0.3$. All of the teachers without a psychology degree had qualifications at undergraduate degree level or higher in another subject, with the most common alternatives being Sociology (5), Social Science (3), Biology (3) and Zoology (3). In our sample, therefore, around 29 per cent of those teaching psychology in schools did not have at least a graduate qualification in the subject. One reason for this may be to do with the way student choices at A-level have shifted over time. Just as psychology has increased in popularity, other subjects have become less popular and it is likely that in schools individuals whose expertise was originally in a different area have responded to changes in demand to take on the role of teaching psychology.

Teaching A-level psychology

The teachers in our sample were teaching to A-level psychology specifications provided by three different examination boards, with 78 per cent of them teaching the Assessment and Qualifications Alliance (AQA) syllabus A (69 per cent) or B (nine per cent), 11 per cent were teaching the Edexcel syllabus and 10 per cent the Oxford Cambridge and RSA Examinations (OCR) syllabus. The high proportion of teachers in our sample selecting the AQA syllabus reflects the picture nationally in 2008–2009 where (omitting students who took the Welsh Joint Education Council [WJEC] syllabus) around 68 per cent of completing AS-level students took the AQA syllabus. However, a greater proportion nationally took the OCR (25 per cent) than the Edexcel (six per cent) syllabus compared with our sample and it should be stressed that the national figures vary slightly, year on year (M. Jarvis, personal communication, June 2010).

As described above, although the content included in each specification is accredited against standard criteria, the courses differ in terms of the topics presented. This difference is most apparent at A2-level where each syllabus has a range of options from which study topics can be chosen. Most teachers in our sample said that they chose which options to teach, either individually or in conjunction with other staff members, based upon the fit with their own knowledge and skills and a consideration of what they believed would be best for their students. While this element of choice allows flexibility for teachers, it also makes it difficult to make simple assumptions about the knowledge-base of students who have successfully completed the psychology A-level. We asked our participants which options they taught 'most often' at A2-level. Table 1 (overleaf) shows a list of the topics available in 2008–2009 to the majority of teachers in our sample who were teaching the AQA-A syllabus and, for each topic, the number of teachers who reported it as one they taught frequently at A2-level. Equivalent information for those following a different syllabus is given in Appendix A.

Focusing upon the data for the AQA-A syllabus in Table 1, it is clear that, rather than choosing to cover general areas of psychology, teachers tended to select topics from different areas. It is worth noting that this does not fit with the pattern of study at degree-level where students typically study discrete modules which cover core areas of psychology. However, this strategy is probably determined somewhat by the structure of the examination, in which students are required to answer questions on topics from more than one area of psychology. It is also clear that some topics were much more popular than others even within the same general area. For example, in the area of physiological psychology 'Biological rhythms, sleep and dreaming' was a very popular choice but very few teachers identified 'Brain and behaviour' or 'Motivation and emotion' as popular. It was also quite

Table 1: Optional A2 topics for the AQA-A syllabus and the number of teachers who identified them as the topics they taught most often (*N*=65).

Area	*Topic*	*Number of teachers*
Social	Relationships	46
	Pro- and anti-social behaviour	43
	Social cognition	4
Physiological	Biological rhythms, sleep and dreaming	38
	Brain and behaviour	6
	Motivation and emotion	2
Developmental	Social and personality development	17
	Cognitive development	14
	Adulthood	0
Comparative	Evolutionary psychology	17
	Determinants of animal behaviour	7
	Animal cognition	3
Cognitive	Attention and pattern recognition	3
	Perceptual processes and development	2
	Language and thought	0

striking that very few teachers mentioned any of the cognitive psychology topics as popular choices, particularly as cognitive psychology is a core component of degree-level courses in psychology. For those interested in A-level psychology as preparation for studying the subject at university this aspect of teachers' topic choice is of interest, given that heads of university psychology departments have pointed to the need for incoming students to have better understanding of biological and cognitive aspects of the subject (Banister, 2003)

It should be pointed out that the range of A2 options presented in the AQA-A syllabus changed for the 2010 academic year although some of the options identified as popular in our survey have been retained. Students are currently expected to show knowledge and understanding of three out of eight topics selected from Relationships, Biological rhythms and sleep, Aggression, Cognition and development, Intelligence and learning, Gender, Eating behaviour, or Perception.

Because A-level psychology teachers are required to teach a broad range of topics across the discipline, we asked our teachers to specify which aspects of the course they were most and least confident about teaching. The two aspects of the course that our teachers were most confident about were social psychology (21/95: 22 per cent) and psychopathology (15/95: 16 per cent). This fits with the data reported in Table 1 which shows that social psychology options at A2-level were extremely popular. Confidence in teaching the psychopathology topic may be based on familiarity as it has been a core A2 topic in the AQA-A syllabus in recent years. Fewer teachers reported aspects of the course they were least confident about but the two topics identified above all others were physiological psychology (17/47: 36 per cent) and statistics (13/47: 28 per cent). Again, this is a very interesting finding given that students who progress to study psychology at degree-level will usually encounter both as core elements of their course. Difficulties with research methods and statistics are often

reported by undergraduates, many of whom express surprise about the amount of time spent studying this aspect of their course (Rowley, Hartley & Larkin, 2008). A recent study has shown that less than 50 per cent of first-year psychology undergraduates at a UK university had expected the statistics element at degree-level and that this lack of awareness had a crucial influence upon their experience of the course (Ruggeri, Dempster & Hanna, 2008). How this aspect of psychology is presented to students at A-level, therefore, may have a significant impact for those who go on to study the subject at university. Furthermore, data from several countries including the UK suggests strong links between levels of student anxiety over statistics and how statistics classes are taught (Ruggeri et al., 2008). Where A-level teachers lack confidence with statistics this could be passed on to their students, influencing how they approach the topic at university. These issues merit further research.

Teachers' views about training

When asked what type of further training would be useful, three main themes emerged in teachers' responses. These focused upon updating psychology knowledge, developing psychology-related teaching skills or upgrading psychology qualifications. Many comments (58/120) referred to courses aimed at enhancing teachers' knowledge of psychology, either by bringing them up-to-date with recent research, providing information about specific topics covered in the A-level syllabus or by providing training in research methods and statistics. Suggestions for training to develop teaching skills (22) focused upon the need for more ideas about practical activities to engage students with learning about psychology and greater access to and training in the use of information technology. Most of the aforementioned comments, therefore (apart from 12 expressing an interest in finding out about recent developments in psychology) suggested a demand amongst our respondents for courses to develop knowledge and skills that would help them directly in their teaching of A-level psychology. A number of teachers (21) said that, particularly for personal development, access to psychology Masters degree courses would be useful but many identified difficulties relating to the time or funding available to them to complete such courses.

Teachers' views about A-level psychology

We then asked psychology teachers to indicate the extent to which they agreed with four statements about characteristics of the A-level course they were currently teaching and with four statements suggesting features that an A-level course should have. Participants responded on a scale of 1 to 5 (1=Disagree Strongly; 5=Agree Strongly). Tables 2 and 3 (overleaf) show the mean responses and percentage agreement for each statement.

There was moderate agreement that A-level psychology provides a good grounding to study the subject at university and that it develops students' analytical and evaluative skills. There was slightly less agreement amongst teachers about whether students currently experience a good range of research methods and that topic areas are covered in sufficient depth ('provides evaluation skills' vs. 'range of methods': $t[108]=2.125$, $p=.036$, $d=0.28$). There was no difference in how school and college teachers responded to any of the statements. Neither was there any difference between the views of those with and without a psychology qualification.

Teachers agreed that A-level students should get plenty of experience of practical work and that it is important they learn how to use statistical tests. There was less agreement that the psychology syllabus should be aligned with what is taught at university ('statistical tests important' vs. 'aligned with university': $t[107]=2.763$, $p=.007$, $d=0.35$) and least agreement of all that the A-level should be a requirement for university study ('aligned with university' vs. 'A-level require-

Table 2: Teachers' level of agreement with statements about the psychology A-level course they were currently teaching. Mean responses (SD) and percentage of respondents agreeing or disagreeing with each statement.

	Mean Agreement (SD)	*% Agree*	*% Disagree*
A-level psychology provides students with a good grounding for studying the subject at university (*N*=107).	3.74 (1.09)	67	15
A-level psychology provides students with the analytical and evaluative skills required to do well at university (*N*=108).	3.66 (1.24)	72	22
A-level psychology students experience a good range of research methods in their practical work (*N*=108).	3.31 (1.25)	62	33
Topic areas are covered in sufficient depth in psychology A-level (*N*=108).	3.28 (1.20)	53	29

Table 3: Teachers' level of agreement with statements about characteristics an A-level psychology course should have. Mean responses (SD) and percentage of respondents agreeing or disagreeing with each statement.

	Mean Agreement (SD)	*% Agree*	*% Disagree*
It is vital that A-level psychology students have plenty of experience of practical work (*N*=108).	3.95 (.98)	77	11
It is important to teach A-level psychology students how to use statistical tests (*N*=108).	3.72 (1.20)	72	19
It is important that the content of the A-level psychology syllabus should be aligned closely with what is taught at university (*N*=108).	3.33 (1.01)	47	21
Students wishing to study psychology at university should be required to hold an A-level qualification in the subject (*N*=107).	2.85 (1.27)	38	47

ment': $t[107]=3.498$, $p=.001$, $d=0.42$). Those teaching in schools ($M=3.54$: $SD=.96$) were more likely than those in colleges ($M=3.03$: $SD=.97$) to say that A-level psychology content should be aligned with what is taught at university ($t[105]=2.611$, $p=.010$, $d=0.53$) but there was no difference between these two groups in their response to the other three statements and there was no difference at all between the views of those with and without a psychology qualification. The lukewarm response shown by teachers in our sample to the idea that A-level psychology should be a pre-requisite for university level study is interesting given that some commentators have argued that having no such requirement weakens the status of psychology as a discipline (Toal, 2007; McCarthy, 2009).

We also asked teachers whether their A-level course could be improved and, if so, to say how this could be done. Out of 96 teachers who responded to this question, 10

said that no improvement was required. From 104 comments made by the remaining teachers the improvements suggested most frequently related to the need for: students to engage more in practical work or stated the benefits of a practical coursework component (32 responses); teaching to become less examination-driven, with more emphasis upon developing students' understanding rather than the retention of facts (26); the course to focus upon fewer psychology topics in more depth (14). Many suggestions linked two or more of these issues and some examples are provided in Box 1 below.

Psychology teachers' views about psychology as a science.

In the final section of our questionnaire we probed teachers' views about the extent to which they saw psychology as a science. We asked them to say directly whether they thought psychology is a science and to justify their response. Around 87 per cent (95/109) of our participants agreed that psychology is a science but six were undecided, and eight teachers disagreed. Compared with Maras and Bradshaw's (2007) study, and following the introduction of the 'How Science Works' strand to the A-level course, a higher proportion of our teachers agreed that psychology is a science. Many teachers justified this by saying that psychologists are involved in theory construction and hypothesis testing (24 responses) or they talked about the use of experimentation or quantitative methods (23). Others justified their response by saying psychology uses scientific methods (or even the scientific method) without expanding upon this (19). Those who weren't sure whether psychology is a science explained this by saying that only some aspects are scientific or that the human subject matter leads to problems with objectivity. Two people questioned the impor-

Box 1: Examples of teachers' suggestions about how their A-level course could be improved.

'We do not have chance to develop appreciation of psychology as a subject because we have to focus so much on the exam. It is a real shame coursework has been removed... as I feel this does not give students a true account of what psychologists actually do.'
(College, with psychology degree, AQA)

'More opportunities for practical work – at present this is mainly time limited by exams.'
(School, no psychology degree, AQA)

'A-levels have become too exam based and I feel that I no longer have the time to develop students skills and abilities in the way we used to.' *(College, with psychology degree, AQA)*

'Less content, more time for application, practicals and development of evaluative and analytical skills.' *(School, with psychology degree, OCR)*

'More emphasis on conducting research. And more current research.' *(College, with psychology degree, OCR)*

'The new specifications require very little thinking or understanding on the part of the students. The so called "evaluation" components only require them to be able to describe some points which their teacher has told them to learn.' *(School, with psychology degree, AQA)*

'Would like the reinstatement of coursework in Year 13.' *(School, with psychology degree, Edexcel)*

'Greater time to understand, less material crammed in and less focus on exams (never going to happen!).' *(School, with psychology degree, Edexcel)*

tance of classifying a discipline as scientific. Overall, those teaching in colleges (6/37) were more likely to say psychology is not a science than those teaching in schools (2/70):$\chi^2(1)=6.245$, $p=.012$, $w=0.24$). Of eight people who said psychology is not a science, all but one (from a school) had a first degree in psychology. However, statistical comparison showed no difference for this question between those with and without a psychology degree: $\chi^2(1)=.598$, ns. The teachers who said that psychology is not scientific questioned the precision of psychological findings, pointing to the lack of a fixed body of knowledge compared with other sciences (five) or they said only some aspects of psychology are scientific (three).

We also presented teachers with a list of disciplines, including psychology, and asked them to rate each one in terms of how scientific they considered it to be (1=Not scientific; 2=Hardly scientific; 3=Some aspects scientific; 4=Most aspects scientific; 5=Extremely scientific). Psychology teachers rated the discipline of psychology ($M=3.69$: $SD=.60$) as *less scientific* than Chemistry ($M=4.91$: $SD=.29$), Physics ($M=4.85$, $SD=.35$), Biology ($M=4.63$, $SD=.50$) and Geology ($M=4.07$, $SD=.68$) (all $t>5.498$; all $p<.001$, all $d>0.59$) but *more scientific* than Criminology ($M=3.37$: $SD=.76$), Economics ($M=2.98$: $SD=.78$) and Sociology ($M=2.78$: $SD=.72$) (all $t>5.150$; all $p<.001$, all $d>0.47$). There was no difference in responses by institution or psychology qualification.

Clearly, although the vast majority of our teachers believed that psychology is scientific they also thought it isn't *as scientific* as some other disciplines. This raises questions about the basis upon which our teachers were making their judgments about what makes a discipline scientific. We also presented the teachers with several statements describing the nature of science and asked them to say to what extent they agreed with them. The statements probed seven aspects of understanding about the nature of science identified by means of a Delphi study (in which the consensus of experts is reached through an iterative process of idea generation and revision) carried out by Osbourne et al. (2003). According to the experts surveyed, 'sophisticated' approaches to the nature of science include the beliefs that scientific knowledge is subject to change, scientific findings are open to peer review and evaluation, the work of scientists involves imagination and creativity, scientific findings are open to interpretation, scientific methods are diverse, and that scientists construct theories and test hypotheses rather than discover the truth about how the world works. How psychology teachers responded to our statements is shown in Table 4.

As might be expected, psychology teachers tended to demonstrate fairly sophisticated views about the nature of science and we identified no difference in responses by institution or psychology qualification. Even so, although the teachers agreed strongly that scientific knowledge is subject to change over time they also tended to say that scientists are involved in finding out the truth about how things work, rather than seeing science as a process of theory construction and revision. This raises interesting questions about our respondents' beliefs about the nature of science. These responses could also provide an insight into why they ranked psychology as less scientific than disciplines such as chemistry, physics and biology. Individuals who characterise science as being concerned with the seeking of truth are more likely to view as scientific those disciplines in which there is an agreed body of knowledge which is generally treated as being true and which have well-established measurement techniques. On the other hand, individuals who see science as a process may be more likely to treat as scientific all disciplines which emphasise theory construction and revision based upon the systematic analysis of data. Where teachers hold the former view then this could have possible implications for how they approach the 'How Science Works' strand of the A-level psychology curriculum.

Table 4: Teachers' views about the nature of science. High scores represent 'sophisticated' beliefs about science, low scores represent 'naïve' beliefs (minimum=1 – maximum=5).

	Mean 'sophistication' rating (SD)
SCIENTIFIC KNOWLEDGE IS TENTATIVE – *'Current scientific knowledge is the best we have but it may be subject to change in future.'*	4.45 (.87)
SCIENCE INVOLVES INTERPRETATION – *'If two scientists disagree about how to explain the results of research, one of them must be wrong'**	4.21 (.88)
SCIENCE INVOLVES CREATIVITY – *'In their work scientists often have to use their imagination and be creative.'*	4.13 (.98)
SCIENCE INVOLVES PEER REVIEW AND EVALUATION – *'When different scientists think different things science becomes nothing more than a matter of opinion'**	3.80 (1.00)
SCIENTIFIC METHODS ARE DIVERSE – *'The only way to produce scientific data is to conduct an experiment.'**	3.60 (1.12)
SCIENCE IS ABOUT TESTING HYPOTHESES – *'Doing science is about discovering and reporting facts.'**	3.27 (1.31)
SCIENCE INVOLVES THEORY CONSTRUCTION AND REVISION – *'Scientists find out the truth about how the world works.'**	2.69 (1.18)

* Statements reverse scored.

Summary and conclusions

In line with the survey of pre-university psychology teachers carried out by Maras and Bradshaw (2007) we found that a substantial proportion of those teaching in schools had no degree-level qualification in the subject. Did our teachers without a psychology qualification approach the subject differently to those qualified in psychology? If so, it would be legitimate to ask whether any differences in approach could impact upon their students' views about psychology. For our questions at least, we found no difference in the views of teachers with or without a psychology qualification. We did, however, find some differences in the views of those teaching psychology in schools compared with those teaching in colleges. School teachers were more likely to say the A-level should be aligned closely with university courses and they were more likely to say psychology is a science. One can only speculate as to why such institutional differences might occur. As regards alignment with university, if school teachers are tied more closely into a process of leading students over a sequence of hurdles leading to university then they might also be more likely to see university courses as the next step in a long-term process. Therefore, a close fit between A-level and university courses would seem logical. Regarding the scientific status of psychology, it could be that those teaching in schools are more likely to see themselves as teachers first, rather than subject specialists, with generic skills and experience developed in teaching a range of subjects. As psychology is now part of the science curriculum, because the subject is required to be taught as science this might lead teachers in schools to take the view that psychology is a science. That is, their views may be driven by their teaching perspective.

On the other hand, psychology teachers in colleges, where a greater proportion have a psychology degree, may be more likely to see themselves as subject specialists in psychology and as a result take a slightly more nuanced view on this matter. Whatever the reasons for these differences, it remains an open question whether they have any impact on students' views about psychology and their expectations about studying the subject at university.

Although the teachers in our survey seemed reasonably happy that the A-level provides a sound basis for university-level study, when asked about possible improvements many lamented the shortage of opportunities for practical work and the lack of time to explore issues in depth. In agreement with the findings of Maras and Bradshaw (2007), quite a number of teachers were unhappy that the course is 'content-heavy' and, in particular, many expressed concerns that too much emphasis is placed upon training students to pass exams. These concerns are not exclusive to teachers of psychology A-level. In recent years, UK Government educational policy has led to an imperative in schools to perform well in league tables measured in terms of student assessment outcomes. When the funding of schools, or even the future of individual teachers, can be strongly influenced by examination results it is understandable that these take centre stage. As one of our participants said, 'Many of the problems that arise are due to exam boards and league tables. We are more concerned with making sure they pass the exam that we forget to make sure they have the skills required for the subject. Due to this schools are moving towards spoon feeding which is wrong.' This is controversial territory. However, one has to consider whether providing students with the information required to pass an examination is the same as helping them to develop a clear and meaningful understanding of the subject. Green (2007), for example, has highlighted the shortcomings of teaching lists of points of evaluation which are then reproduced faithfully by A-level psychology students in their examination answers, sometimes without clear evidence of understanding. Hardman (2008) has pointed to research which shows that better retention and understanding is seen in university students who have learned material at a deep rather than a surface level. Hardman recommends reducing the content of the psychology degree and encouraging students to study it in greater depth. These comments may be worth consideration in relation to A-level psychology.

Although there has been some support for the idea that psychology A-level should become a pre-requisite for studying the subject at university (Toal, 2007; McCarthy, 2009) in our sample at least teachers were not widely supportive of this idea. Presumably in universities, where large numbers of students are accepted onto psychology degrees without the A-level, there would not be too much support for this idea either. However, the current fit between A-level and university study is far from satisfactory. As pointed out by a number of commentators, the lack of standardisation across examination boards, both in terms of topics and how they are covered, means that making links between pre-university and undergraduate psychology is not straightforward (Banister, 2007; Green, 2007; Rowley, 2009). The A2 topic choices made by our teachers were informative in this regard as some of the least popular choices were in core areas, such as biological and cognitive psychology, that are required study for all students taking a Society-accredited degree course. These areas have been identified previously as being those which many new students find problematic (Banister, 2003; Rowley, Hartley & Larkin, 2008). Although greater familiarity with them would probably be beneficial for students going on to study psychology at university, options in these areas were not selected frequently by our teachers.

It is arguable, however, whether any real progress can be made in creating clearer

links between university and pre-university courses while there exists a market for A-level courses in which several examination boards compete to recruit students. To some extent, examination boards have to show where they differ from their competitors in order to attract customers. In education terms, the potential problem at the heart of this system lies with what the customer might see as attractive. We have already seen that, for the teachers and schools who weigh up the relative benefits of various courses, student results are of central importance. The obvious risk is that there occurs a natural pressure in the system to create a demand for courses which include topics and forms of assessment which are judged more favourable to student success. And against courses which are judged more difficult.

On the other hand, examination boards are required to develop their courses in line with existing specifications and it could be argued that the A-level should be treated as a course in its own right, independent of the requirements of university level courses. Most students who complete A-level psychology do not go on to study psychology at university and some do not go on to university at all. To some extent A-level courses need to be devised with this in mind. Banyard (2008) makes an interesting comparison with HE courses where the vast majority of psychology students do not go on to become psychologists. He suggests that, not only could degree level courses be adjusted to have more real–life relevance to the majority of undergraduate students, perhaps undergraduate courses could be adjusted to provide a better fit with how psychology is taught in schools, rather than the other way around. Clearly, whatever we think about the mismatch between pre-university and university courses a simple solution to the problem is unlikely to occur overnight. In the meantime it would be useful for university lecturers to be aware that it is difficult to make assumptions about what core knowledge students who have completed psychology A-level bring to undergraduate study.

Finally, when asked about the scientific status of psychology, our respondents were more likely than those in Maras and Bradshaw's (2007) study to say psychology is a science. It is unclear whether the more recent inclusion of the 'How Science Works' strand into the A-level syllabus influenced the views of our teachers. However, it was quite revealing to see that despite almost unanimous agreement that psychology is a science, it was not judged to be as scientific as 'physical sciences' such as chemistry and physics. On the face of things, this looks to be quite contradictory: psychology is a science, but not as much of a science as some other disciplines. Maybe the idea, held by quite a number of our respondents, that science is about finding out the truth has something to do with this. Other sciences, except perhaps at the frontiers of current knowledge, appear to have subject matter which seems more amenable to producing hard facts than psychology and have already generated a large corpus of data leading to well-supported explanations of phenomena. In comparison, psychology appears less well-advanced. For a discipline wishing to present itself as scientific this could be problematic. On the other hand, this could point to an opportunity for psychology to contribute positively to how science is taught in schools. As a relatively young discipline, in most areas of psychology theories are currently being constructed, tested and revised. By teaching students about current research in psychology, therefore, we have an opportunity to bring alive the process of doing science.

Acknowledgment

The authors would like to thank Matt Jarvis for his comments upon an earlier draft of this paper.

Correspondence

Martin Rowley
School of Psychology,
University of Keele,
Keele,
Staffordshire ST5 5BG.

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Appendix:
Optional A2 topics for the AQA-B, Edexcel and OCR syllabuses and the number of teachers who selected them as the topics they taught most often (*N*=26).

AQA-B syllabus (*N*=10). A2 topics from the following options were taught most frequently: Child development (cognitive, 8; moral, 6; social 4; exceptional, 1); Atypical (definitions, 4; anxiety, 4; moods, 7; treatments, 4); Health 0; Contemporary issues (criminal, 4; relationships, 1; parapsychology, 1; substance abuse, 0).

Edexcel syllabus (*N*=10). A2 options most frequently taught were: criminological psychology, 8; child psychology, 3; health psychology, 9; sport psychology, 0.

OCR syllabus (*N*=6). A2 options most frequently taught were: forensic psychology, 6; health psychology, 4; psychology of sport, 0; psychology of education, 2.