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## Foreword

**Professor Ray Iles**

*Director of Research and Postgraduate Studies, School of Health and Social Sciences, Middlesex University*



The Oxford Concise Dictionary defines an academic as one who conducts research or teaching at a University. Undoubtedly, to be a modern academic you must do both and to be a scholar of international standing you must strive to excel at both. Indeed, British Universities are judged on both our teaching and research performances. In the former, we are rated among the best Universities in the nation. In 2007, we will be judged on the latter in the HEFCE Research Assessment Exercise. As stated in a previous forward to this Journal by the Assistant Vice-Chancellor (Research), Professor Waqar Ahmad, "Middlesex is an ambitious University". Nowhere is this ambition clearer than in the School of Health and Social Science.

The School is looking to submit staff in five or six unit of assessments (UoAs): Biomedical Science, Social Policy, Geography, Nursing, Psychology and Sports Science. We are closely monitoring our performance and, in October 2004, we had a mock RAE in five units of assessment. We achieved one 5/5\* two 4s and two 3s by external University assessors (5\* is the highest score as judged by the 2001 RAE process). On a University wide scale, we have scored the best. Many congratulations to our staff. However, we cannot be complacent. Lessons have been learned and we continue to grow: our research activities strengthen in every area, as exemplified by this Journal's encouragement of the research publication culture in our school.

The criteria by which we will be judged in 2007 have become more explicit and encompass three themes: research output (publications), environment (research culture, grant income and strategy) and marks of esteem. A judgment on quality will be made on our submission of research profiles within these three criteria. The latter is

perhaps the hardest to define but is based on the national and international reputation of individual Middlesex University staff in their academic areas. However the greatest weighting of research performance will be a judgement of our research output (publications) and our research culture.

The Journal of Health, Social and Environmental Science is a very tangible demonstration of the research ethos and environment of our school in the five to six UoAs we will be entering in the 2007 RAE. It is important that junior academic are encouraged to 'cut their research teeth' by submitting to this Journal and then on to international publications. I am very impressed by not only the quality but also the volume of articles. This bodes well for the future.



# Introduction

**G Neil Martin**

*Editor, Principal Lecturer in Psychology, School of Health and Social Science*



## Introduction

If a three-pronged leitmotif emerges from this issue of the Journal, I suspect it might reflect preparation, variety and innovation. Widening participation in HE, writing an on-line degree subject course, predicting alcohol problems, a review of epilepsy and its treatment, an analysis of health research protocols, as well as views of interpreting emotional states and of the development of recipes in modern Europe: the roll-call of papers testifies to the unusual diversity and breadth of interests canvassed by the Journal's remit. They also provide original views, some original data, and some original ways of developing material or evaluating research approaches (or, sometimes, all three).

The traits percolating this issue are those which characterise most academics' approach to the Research Assessment Exercise in 2007/8. At a time when most researchers in most Universities are alacritously preparing their best work to be judged according to the conventionally nebulous criteria of an RAE panel, it is useful to reflect on the Journal's role in this process.

The Journal is now 5 years old and encourages submissions from students, academics and others whose contributions meet the standards of an academic journal. The last point is important because 'local' journals, as this publication might be perceived as being, may be regarded less highly than its more prestigious, international cousins. The prejudice belies an interesting truth: colleagues formally and informally disclose how rigorous they regard this organ's reviewing process. As one colleague confided, "this is tougher than some of the international journals I've been published in." And this is an advantage of which the Journal and its Editor-in-Chief can be proud.

While the emphasis is on finding good reasons to accept a paper rather than bad reasons to reject, the Journal's processes are robust, diligent and fair. It does reject bad papers but if it sees merit in a submission's substance, it

will allow the author to make a better re-submission. A young journal, of course, still attracts 'rogue' submissions because it is felt to be less demanding than more well-established cousins. This problem befell, for example, *Humor: the International Journal of Humor Studies* for many years before it established itself as a paradigm of its kind. Cacographies, missing abstracts, poor use of language, aberrant referencing, over-reliance on perpendicular pronouns, failure to proof-read, intellectual myopia, erratic structuring, and inadequately developed ideas are all characteristics of papers the Journal has rejected and this is a useful piece of information for prospective authors. But the Journal evolves and with its increasing rigour should come increasing external exposure.

Those that presented few of these problems are in the current issue. Cunningham's paper is a timely consideration of the government's controversial widening participation strategy and describes how a School at Middlesex University has attempted to, in the jargon, 'engage' with this strategy by introducing a novel approach to the issue.

Martin, Brunswick and Jolic's paper is a detailed description and evaluation of their development of an on-line undergraduate course in psychology. Readers might find the experiences recounted, as well as the information provided, useful if they are considering developing similar courses.

The role of alcohol in coping is one of the key features of Sale, Guppy & El-Sayed's paper. The authors administered the Alcohol Use Disorder Identification Test (AUDIT) to predict alcohol use, alcohol problems and the use of alcohol to cope in a cohort of 187 University students. Over half of the respondents were classified as having alcohol consumption that was hazardous to health.

The history of people's perceptions of epilepsy and its treatment is the subject of Busia & Murphy's article. Epilepsy is a disorder, often of indeterminate aetiology, which is characterised by seizures in the brain. It appears either in early childhood or in very late adulthood (it can, rarely, appear in-between, too). Views of the disorder, as well as its treatment, have varied widely and wildly throughout history.

Caldwell, Henshaw & Taylor's article describes a framework for criticising qualitative and quantitative health research approaches. They conclude that, although their model was initially developed for use by undergraduate researchers, it can be effectively used by postgraduates and inchoate professional researchers.

The issue concludes with two conference reviews. Stobart provides an illuminating account of a conference that examined the development of recipes in modern Europe and how these reflected culinary and medical practice. Coulson uses a review of two recent conferences on interpreting emotional states to reflect on what an emotion actually is (emotion has, in one well-known neurophysiologist's words, been "a slippery concept for both psychologists and neuroscientists.")

With innovation in intellect also comes innovation in practice: this will be the first issue of the Journal to be made available on-line. This is a further step towards greater external recognition for the Journal.

Before signing off and allowing readers the opportunity to dip into the Journal, some words of thanks. This issue was edited while I was in the throes of writing three books and eyeing wearily the staggered 2005 deadlines that such a commitment brings. My thanks to Rena Papadopoulos and this issue's reviewers for all of their work. Finally, the issue –and, as I'm certain the Editor-in-Chief would agree, all others- would not have been possible without the talent and industriousness of the administrative powerhouse of the Journal, Chris Constantinou.

# Exploring widening participation in one School at a North London University: A case study

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## Abstract

The subject of 'widening participation' appears in every school, further and higher education policy and strategy not least because it is high on the government's agenda but also that future funding sources may depend upon it. (Woodrow, 2000; DfES, 2003a). Since 2001, Universities in England and Wales have been required to produce a widening participation strategy. Such strategies involve adopting a variety of approaches including raising awareness of opportunities within further and higher education and career progression choices and opportunities, to pedagogical developments. This paper discusses this widening participation strategy within a local university context and describes a case study of a novel widening participation activity which has been developed and delivered at a north London University.

## Key words

Widening participation; education policy; university access; higher education.

## Introduction

Since each University in England and Wales was required to produce a Widening Participation strategy by the Higher Education Funding Council (HEFCE) in 2001, each University has thus had to acknowledge some commitment to it. Recent evaluations, however, indicate this commitment has been variable between and within that institution (HEFCE, 2004).

The original areas HEFCE (2004) identified were broad: raising aspirations, widening access to under-represented groups and ensuring students have the best possible chance to succeed. However, more recently the strategy has moved onto encompass extending the above and developing research into six areas. These areas are: cost, outreach and raising aspirations, access and admissions, retention and student achievement, lifelong learning and employability and postgraduate progression, in essence the differing aspects of the 'student life cycle'. This is clearly gaining momentum and is a feature for higher education for the foreseeable future.

## Context of widening participation

Reports published in the last decade have emphasised the role of education, particularly Higher Education (HE) in shaping the economic wellbeing of the country. The National Inquiry into Higher Education (NCIHE: Dearing Report, 1997) reported that British HE was still systematically failing to recruit sizeable groups of the population, particularly those from lower socio-economic groups. In response, the Green Paper on Lifelong Learning, The Learning Age (1998) argued the case for widening participation on the grounds of economic competitiveness and social inclusion. In addition, they focused on broadening and then continuing to help students fulfil their personal, academic, vocational and professional potential (Stephenson, 1998).

Latterly, two key documents published by the government in 2003 addressed the issue of participation amongst lower socio-economic groups. The first was the White paper 'The future of Higher Education' (DfES, 2003a) which introduced what was described as a 'radical reform' to make more universities available to students and as a consequence be influential in economic development. This was, of course, to be measured through benchmark targets. The second paper was a consultation on 'Widening participation in Higher Education' (DfES 2003b) which emphasised 'fair access'. Following from this, the Office of Fair Access (OFFA) was created to regulate access and charged universities with the task of 'identifying, encouraging, admitting and supporting to graduation all those who have the potential to succeed whilst also maintaining high standards of research and teaching' (OFFA, 2004).

The 'modernisation' policy of the current government with its focus on social justice, employability, lifelong learning and integration has been the underlying influence on higher education and public service changes (Harvey, 2000). Ultimately, the social reforms are necessary through education *as participation in higher education equips one to operate productively in the global knowledge economy* (HEFCE, 2004). Parker (2003) argues that widening participation is an aspect of lifelong learning. It is not a new concept in itself but the focus on tertiary education is new. Parker (2003) also

argues that the difference between learning and education also has an economic underpinning which is threaded through various government documents. The definitions of learning and education thus incorporate questions of where responsibility lies and with this the issue of who should fund the provision. Those who want to benefit from HE must pay for it.

McNicol (2004) argues that a commitment to greater participation in higher education by lower socio-economic groups has existed for more than a century. Additionally, social issues apparent in policy documents from the early 20th century are still featuring in contemporary policy documents. Furthermore, McNicol (2004) asserts that whilst progress is made on one aspect, the overall social divide is still evident and prevalent in contemporary policy 'reforms'. The rationale for social policy reforms may change for political expediency: a century ago it revolved around social benefits and mobility whilst currently the focus is on economic value (Gorard, 2001, McNicol, 2004).

The actual definition of widening participation is also an issue. The precise definition of widening participation is obscured within position statements from bodies such as Universities, UK, HEFCE and the Department for Education and Skills. The Institute for Learning and Teaching (now Higher Education Academy) in the members' website refers to it as a process to increase student numbers to HE whilst also being 'socially inclusive'. This refers in general to specific socio-economic groups and ethnic or disabled groups (HEA, 2004). In addition, Action on Access, the national co-ordination team appointed by HEFCE and the Learning and Skill Council, assert that it is about patterns of attendance (or retention) and not just numbers especially with the persistent gap in social class participation (Action on Access 2004). HEFCE (2004) define widening participation broadly as 'widening access and improving participation' incorporating all the above assertions. In an earlier paper, HEFCE (2001) acknowledge there is no single definition and it is open to interpretation by individual higher education institutions (HEIs). Higher education is a changing sector with the most significant change being the transformation from an elite to a mass system (Jary & Jones, 2004). However, as Knowles (2000) points out, this increase has deepened social rifts by the perceptions of the financial burdens it seems to imply. The focus, thus, appears to be on 'potential' in terms of ability though this is difficult to establish and challenge.

To push forward social changes, the targets set for Higher Education by the Government are explicit and seemingly daunting. These include:

- 50% aged 18-30 should benefit from HE by 2010 while maintaining standards
- Widening Participation in HE, in the sense of a more representative social mix

- Significant year-on-year progress towards fair access for all social groups to all institutions.
- Lower rates of non-completion

(DfES 2003a)

Widening access is also a resonant feature in many occupational groups (HEFCE 2004b). In considering the health and social care sector, the Department of Health (DoH) and HEFCE have identified cultural and social class differences within these occupational sectors e.g. under representation in Asian ethnic groups in nursing and black Afro-Caribbean males in allied health professions (HEFCE 2004b). They propose addressing the difference through focused activities from HEFCE-funded, thematic widening participation groups but also by waiving tuition fees for all or part of a course.

## Widening participation initiatives

The large number of interrelated groups and initiatives all striving to achieve the same purpose has led to confusion and, at times, a multiplicity of events and activities. AimHigherP4P, part of the Higher Education Funding Council for England (HEFCE), and The Learning and Skills Council (LSC) have both been central. Whilst multifaceted, their work has contributed to increasing and widening participation. Funding is another issue, whereby streams of funds invoke a range of activity and project developments of varying complexities. However, the impact and success of these activities seems difficult to measure (Gandy, 2002). Invariably, funding sources are limited and finite and target specific groups (e.g. ethnic or cultural groups). Current AimHigher funding streams continue until March 2006 (AimHigher 2004) and the continuity of activities (and thus levels of impact) beyond this date is dependent upon further funding from Government or other sources. The varying strands of funding echo the various aspects of widening participation activities such as Special projects (eg. HEFCE Summer schools) and HEFCE Thematic partners (eg. The Advice Clinic for Health Professions, Sports Thematic Group). The focus of HEFCE (and latterly in association with DfES and LSC) is the integration of some initiatives and to support and extend partnerships between HE and further education (FE). The question remains if such activities are effective can they be sustained if funding ceases?

## Case study: Middlesex University, School of Health and Social Sciences

In its mission statement, Middlesex University identifies itself a 'student-centred' university. It maintains a commitment to diversity and flexibility within studies, engendering a culture of lifelong learning. There is a long history of commitment to widening participation. This is evidenced through a variety of activities such as taster days and career talks on one hand and education liaison

work in surrounding geographical boroughs. The Association of occupational groups with subject specific groups is also a feature i.e. HEFCE-funded pan-London Health Thematic Group. Furthermore, each school within the University has been charged with developing and articulating a widening participation strategy which complements its Retention and Progression Strategy.

The School of Health and Social Sciences (SHSSc) has approached widening participation in two ways:

1. Outreach work (raising aspirations, abilities and opportunities, inclusion to HE).
2. Inreach work (student progression, retention and pedagogical developments).

## **Outreach activity**

Examples of outreach activities include participation in the Open days, attendance at careers fairs and visits to schools and colleges to give talks on higher education and employability skills to parents and school students.

A recent development from Middlesex University have been Professional Aiming for College Education (PACE) days. These days reflect the negotiated activity between University, schools and health and social care practitioners. These combine a number of elements focused around raising awareness and aspiration. Aiming for College Education (ACE) days are an annual feature of central Middlesex AimHigher activity but these PACE days have a Health and Social Sciences theme.

PACE days were developed to provide a broad 'taste' of a number of health and social science professions to school students in years 9 and 10 (prior to GCSE). In addition, information on entry to, and progress through, the professions was addressed as well as the opportunity for the school students to meet and quiz health professionals, University lecturers and student ambassadors. The interactive workshop sessions whilst short (30 minutes per profession) were designed to engage the school student's interest and disseminate information about the profession. Each school student experienced five different workshops (from five different professions) from the eight professions represented. These were interspersed with plenary sessions to reflect on the experiences. In total over the three days of PACE, 310 school students participated from eight different schools located in two North London boroughs. Both of the two geographical boroughs represented a wide range of ethnicities and socio-economic levels resonant within Government targets.

This intensive activity has had advantages and disadvantages. On the positive side, the written feedback from the school students indicated enjoyment of the

sessions and valuable insight into the health professions but also University life. The feedback from the workshop facilitators and accompanying school teachers was also positive. The accompanying teachers reported gaining insight into the type of work carried out by University professionals and staff. This indicates another area where activity should be focused: improving teacher awareness. In addition, workshop facilitators reported insights into school student perceptions and a sense of 'where students come from'.

The disadvantages were mainly logistical: hosting such events with large numbers can be difficult. In addition, varied awareness of barriers, perceptions and preparation of school students to HE were highlighted by many workshop facilitators. The success of this activity beyond the PACE day feedback remains to be seen. There is an argument for strengthening the impact and providing a platform for further progressive activities, however this requires further resources.

The case study exemplifies aspects of widening participation identified in the strategies of HEFCE. As a result of the range of widening participation initiatives, there are several areas where partnerships are developed and activities delivered in collaboration with current AimHigher co-ordinators for the North London geographical boroughs, the North Central London Strategic Health Authority Workforce Development Directorate careers co-ordinator and other employers and stakeholders; with wider reaching groups such as HEFCE thematic groups e.g. The Advice Clinic, Sports Group; and with work within the School's own Institute for Community Development and Learning. This increases the range and scope of widening participation activities and support before, during and after the student experience. The challenge is to develop more sustainable activities, which have deeper long lasting impact, and to evaluate that impact.

## **Issues for future consideration**

A successful widening participation strategy integrates all areas and policies which affect student experience (HEFCE, 2004). On analysing the strategy from Middlesex University, there is integration of teaching and learning, student support and retention strategies focused around the student life cycle. Alongside this, there is articulation of lines of responsibility and accountability. It must be acknowledged that widening participation is evolving but so, also, is the education sector throughout. The issue of academic staff development is an area for addressing. Literature is replete with modernising delivery of programmes of study and being a demand driven provision by students (Action on Access, 2002). However, there appears to be insufficient attention to 'awareness raising' for university staff. In the main, if activities are co-ordinated and

delivered by AimHigher or education liaison personnel then the issues which affect programmes (and student retention and success) will not be given adequate significance. The partnership in this instance needs extending across HE areas as well as to outside partners.

In the review of higher education, Dearing (NICHE 1997) identified two further significant points: transition and employability. A significant aspect of strategies thus need to consider this. The difficulty in conceptualising the challenges and influences whilst moving through the higher education system is compounded by measures such as HEFCE performance indicators which inadequately reflect the diversity of the students groups and experiences (i.e. poor focus on subject level performance as opposed to institutional). Layer *et al* (2002) identify this as crucial as the majority of the support for students lies at subject level, and incomplete pictures of this make comparisons of curricula difficult. Additionally, Layer *et al* (2002) reports only 38% of institutions analysed admitted carrying out research into interventions to enable them to evaluate the effect of activities to support students. This has led to some, though limited, exemplars of good practice and more of this is needed within and across the HE sector.

In many institutions, the implication is that all students are being prepared to degree level and yet with some professional programmes many are sub degree and incorporate the most diverse students groups which easily fulfil the widening participation criteria. Yet, as professional programmes, there is also the added rigour of professional standards and the question to how these are applied within a widening participation approach. One could argue that once in Universities, widening participation students are not easily identified and why should they be. If support mechanisms and teaching and learning developments are student-centred, then they should address any student issue, so how is success for a widening participation strategy to be measured? The developments of vocational routes in secondary education and consequently vocational courses within tertiary education has implications for transition through the education levels. This is significant as the DfEs (2003a) has indicated that the majority of its targets will be met through vocational routes and in particular Foundation degrees.

In a review of the HEFCE thematic groups in the North East of England, Dodgson (2002) asserts that institutions need to focus on themselves to sustain change for social inclusion. There are issues of clarity in defining terms and also measuring performance. Performance indicators may not be sufficiently sensitive to the diversity of local groups; a particular example is the definition of socio-economic status via use of post-codes and is limited. Clarity on what constitutes 'achievement' is also an issue, this is defined in many areas as retention and yet this alone is evidence of longevity, but the softer or more personal aspects of

achievement are unclear. These are ongoing areas of development within many Universities and arguably there must be connected thinking and working with recruitment, teaching, learning, assessment and retention reviews and strategies and research.

Institutions are required to engage in widening participation but there are critics vocal against the concept (Day, 2004; BBCNews 2004). The reputation of Universities is an issue. The publication of league tables and, latterly in 2002, the THES Access Elite table, is also an issue, especially as research was a criterion for this league. In a benchmark culture, success can clearly be ascertained in a number of ways (Harvey, 2000). Whilst it is not associated with recruitment specifically, it is accepted that engaging more with the community and potential university students will undoubtedly be beneficial to recruitment as well as to the calibre, preparation and success of potential students (HEFCE, 2004)

## Conclusion

Higher education and tertiary education in general is a changing sector and the shift from an elite to a mass system of education has produced its own challenges. The issue of widening participation aims to further diversify the tertiary education system. This compounded with the social inclusion moves directed by educational and social policy have increasingly diversified the student population, which is likely to increase if the central Government targets are to be met for 2010. Whilst all institutions need to engage with widening participation this has now become imperative under the fair access regulator. The need to widen access is shared across several occupational groups not only those discussed here and thus a need for collaborative activity. The PACE day case study presented in this article represent an example of focused committed activity indicating partnership and awareness raising on both sides of higher education. The institutional strategy which is the driver of such activities has some significant strengths but also has areas which need further consideration specifically, consideration of student transition and staff awareness (and contribution).

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# Developing an on-line undergraduate course in introductory psychology

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## Abstract

In this article, we describe the process of developing a first and second edition of a professional, commercial, on-line course in introductory psychology. We review some of the advantages and disadvantages of on-line pedagogy and outline some of the contingencies and disparities between the original conception of the course and its actual development and execution. The article also outlines some potentially useful recommendations for other authors who are interested in using the Internet as a tool for developing and presenting similar pedagogical material.

## Keywords

Internet; online courses; assessment; pedagogy; psychological assessment.

## Introduction

The past decade has seen an explosion in the use of the World Wide Web as a medium to facilitate teaching and research. The Internet has been effectively exploited as a novel and innovative academic tool not only for disseminating data, findings and ideas but also for engaging in activities that range from conducting research (Reips, 2001), to designing departmental web-pages (Plaud, 1996), to running tutorials (Krantz and Eagley, 1996) to editing books with multiple author contributions (Levy & Randsell, 1996).

One innovation that has potentially important implications for tutors and students is the development of on-line courses (Kinney, 2001; Carr-Chellman & Duchastel, 2000; Schweizer, 1999; Waschull, 2001). The benefit of such courses is that they provide a great deal of student autonomy and allow a greater facility for distance learning. If the teaching materials are clear, interactive and engaging, the student need not physically be in the classroom with the tutor. This idea is not novel. Since its inception, the Open University has based its pedagogy extensively on this approach, via the use of

video-based interactive learning. The growth of the Internet and the development of more sophisticated electronic technologies, however, has meant that an increasing number of universities and colleges is adapting their courses and creating interactive, on-line versions of them to meet the needs of students who prefer, or who would benefit from, distance learning (Kinney, 2001). There are now on-line versions of courses in health psychology (Upton & Cooper, 2001), social work (Stocks & Freddolino, 1998), nursing (Cravener, 1999), introductory psychology (Waschull, 2001), child development (Graham, 2001) and research methods (Wang & Newlin, 2000), among others.

During the past four years, the first two authors have been engaged in the development of a commercial on-line course in psychology for an international educational publisher (Pearson Education). In this article, we describe the process involved in designing and implementing such an on-line course, and developing its second edition. We highlight the benefits and limitations of on-line pedagogy and provide what we believe to be useful recommendations for other authors interested in using the internet as a pedagogical vehicle.

## On-line courses: purpose and outcome

On-line pedagogy has a relatively brief history. Until recent advances in technology, tutors had exploited on-line opportunities in a variety of basic ways, from making available unadorned lectures and lecture notes on-line, to providing Internet, 'self-assessed' quizzes, to elementary on-line tutorial discussions. The development of pedagogy-specific software, as well as a shift in academia towards distance learning, has led several tutors to create complete, fully autonomous, self-contained courses involving on-line assessment.

Although data are limited, there is evidence that such advanced on-line methods of course delivery do not necessarily disadvantage those who avail themselves of it, compared with students who attend traditional

classroom lectures (Hiltz, Coppola, Rotter, Turoff & Benbunchan-Fich, 1999; Waschull, 2001; but see Wang and Newlin, 2000). Some evidence suggests that on-line delivery might actually be more advantageous. In one study, which compared the effectiveness of teaching an introductory psychology course via the web with teaching via traditional lectures, Maki, Maki, Patterson and Whittaker (2000) suggested several good reasons why delivering material via the web may be the more effective method: attendance at lectures can be poor, students may become uninterested and restless (and may irritate those who aren't). All of these factors might diminish the students' own learning experience. Fatally, but controversially, they argue, there is no good pedagogical reason for the lecture-based format.

Maki *et al* (2000) found that those who followed an on-line course showed greater knowledge of the content of the syllabus than did those who followed a lecture-based course. Examination performance was also better in this group. Web-based courses were praised for their convenience but when both types of course were evaluated by the students, the lecture-based format received the most positive ratings, suggesting that learning and satisfaction with the course can be independent of each other: A format which yields better academic performance may not necessarily be the one that is regarded most positively.

There is also evidence that the more the students use the material they are presented with, the better they perform. Upton and Cooper (2001) found that the grades of undergraduates in psychology were higher when they undertook an on-line health psychology course than when they followed a conventional lecture-based course. This improved performance correlated with increased time spent on the learning materials.

When Wang and Newlin (2000) examined predictors of students' performance on a 15-week on-line course in statistical methods, they found that total on-line course activity, intellectual inquisitiveness and number of homepage hits in the first week of the course were significant factors. The last factor is especially interesting because, the authors note that, 'web instructors do not have the usual set of cues (e.g., facial gestures and fidgeting) that might be indicative of student confusion.' They conclude that 'web instructors should closely monitor students' on-line course activity during the first week of the semester. The lack of this activity may be interpreted as a reliable early-warning indicator of poor performance later in the semester.'

## **Pearson Education on-line course in introductory psychology**

In 2000, the first two authors were approached by Pearson Education with a proposal to develop the publisher's first international on-line, commercial course

in psychology. Martin authored the European adaptation of Carlson and Buskist's fifth edition of *Psychology: The Science of Behaviour* (published by the Pearson company, Allyn & Bacon) for Pearson. The objective behind this major publishing undertaking was to introduce to the European market a leading introductory psychology text for undergraduates which had the production values of the American heavyweight texts and the thoughtful and critical pedagogy of their European counterparts (see Martin 2001, for a description). The first edition was published in 2001 (Carlson, Buskist and Martin, 2001); the second in 2004 (Carlson, Martin and Buskist, 2004).

To enhance the overall package, an on-line course was proposed which complemented the book's other ancilliary materials. For students, these materials included a Companion Website which featured web exercises for each chapter (these were designed to encourage students to use the Internet to find out information about chapter-specific topics) and bi-annual research updates, where each chapter would be updated on-line in the form of reviews of recent research that were noteworthy, interesting, important or novel. For tutors, this included a test bank of over 2800 multiple choice questions, over 700 true-or-false questions, 180 essay questions with guidance notes, 60 powerpoint slides with explanatory text, and a Lecturer's Resource Manual (Buskist and Brunswick, 2001; Brunswick and Buskist, 2004), which provides extensive material and suggestions for discussion and experiments in tutorials and seminars, as well as providing essay topics with guidance notes. All ancillary materials for the European edition, apart from the web exercises and research updates, were created and prepared by the second author of the current paper.

The on-line course was originally conceived as independent of the book. However, in its second incarnation, it was closely allied to the book and its structure. The course was designed to cover every major branch of, and topic in, psychology that first year undergraduates would expect to encounter - from the history of the discipline, to the biological bases of behaviour, to child development, to memory and learning and social psychology. It would fulfill British Psychological Society requirements for level one material but would not be restricted to any national or societal demands because the course would be sold across Europe, Asia and Australasia, where course requirements differ. The course comprises 18 topics (see Table 1).

**Table 1:** The complete list of topics in the course and the author responsible

	Introduction to the course	NM
T 1:	Introduction to Psychology	NM
T 2:	Methods of Investigation in Psychology	NM
T 3:	Evolution, Genetics and Behaviour	NM
T 4:	Psychobiology and Neuroscience & Drugs and the Brain	NM/NB
T 5:	Sensation	NM
T 6:	Perception	NB
T 7:	Learning	NB
T 8:	Memory	NB
T 9:	Consciousness	NM
T 10:	Language	NB
T 11:	Intelligence and Thinking	NM/NB
T 12:	Developmental Psychology	NB
T 13:	Motivation and Emotion	NM
T 14:	Personality	NM
T 15:	Social Cognition and Attitudes	NB/NM
T 16:	Interpersonal and group processes	NB/NM
T 17:	Health Psychology	NB
T 18:	Abnormal Psychology	NB

NM=Neil Martin; NB= Nicky Brunswick

## Course aims and structure

The aim of the course was to provide the student with an autonomous on-line learning package in psychology that would allow him/her to learn about, and to understand, the basic principles, findings, theories and models in psychology via a series of interactive exercises. These exercises included conventional multiple choice questions, as well as drag and drop exercises, true or false questions and also more advanced animated exercises which involved direct participation by the student in an interactive environment. The principal guiding principles of the course were that it would:

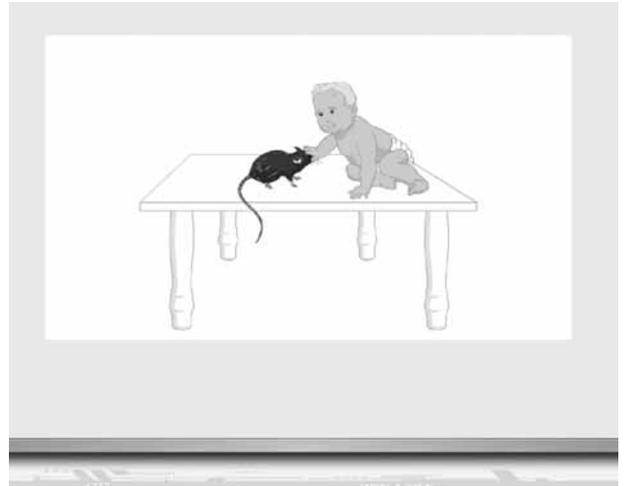
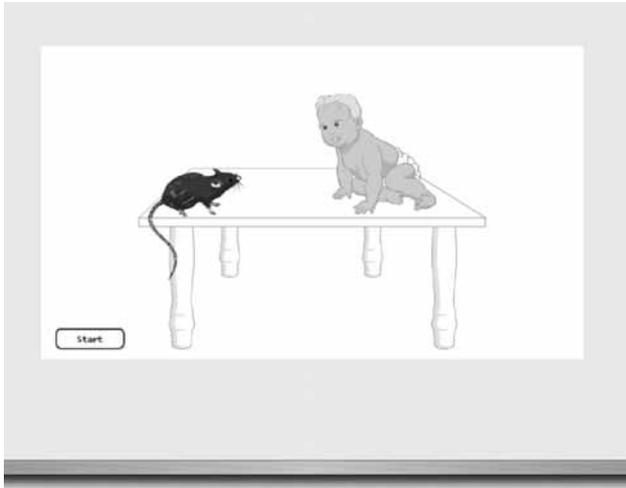
- Include material on all the major topics in psychology at the introductory level
- Be useable without the need for intervention from a tutor
- Be easy to navigate
- Present topics in an attractive way that would not overload the viewer
- Allow students to go through the course at their own pace
- Provide the student with feedback on their performance throughout, with corrective feedback where appropriate
- Allow the course tutor to use technology to its best effect, especially its facility for formative and summative assessments that are 100% accurate, and the ability to customize the course (Topics can be deleted or added)

- Be interaction-driven so that the student would be actively engaged in study and exploration (rather than being a passive reader of text)

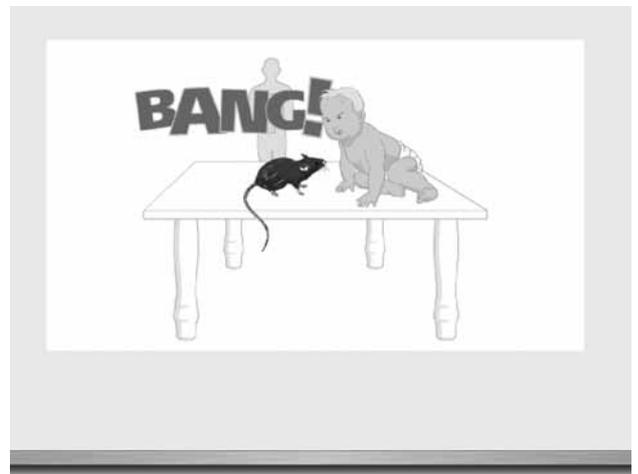
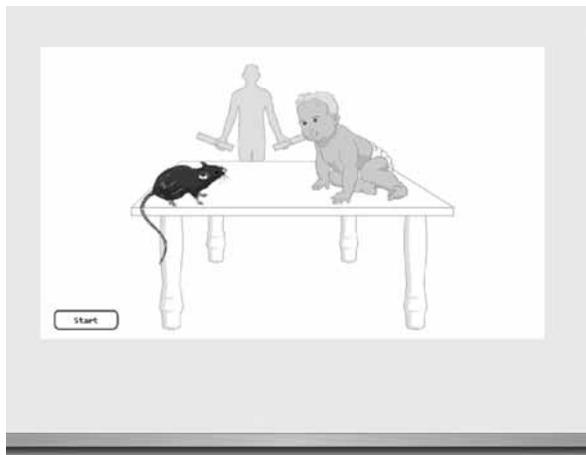
The principle that the course be interaction-driven was crucial. Many of the early on-line courses in psychology and other disciplines were simply cut and pasted text with the occasional illustration, thus reinforcing the notion that the student was simply reading an Internet version of their textbook. While many courses still adopt this approach, but with interactions now created and linked to sections of on-line text, this course set out to be fully exploratory and challenging. As Schweizer (1999) noted in relation to the benefits of on-line courses over traditional classroom formats, “learners need a complex, activity-rich learning environment which arouses interest, curiosity, and offers multiple ways to make meaning” (p29). While text was used to introduce a concept or an experiment or a model, the bulk of the course involved the student performing some task, whether it be exploring a figure, animation, video file or sound file, dragging and dropping labels onto parts of the screen, viewing animations and answering questions about them, completing pit-stop quizzes or taking part in experiments.

Figures 1a and b, for example, show screengrabs for the animations used for the exercise testing students’ knowledge of the Little Albert experiment (Watson & Rayner, 1920), which formed part of the exercises in topic 7 (Learning).

**Figure 1a**



**Figure 1b**



*Figure legends*

Figures 1a-b. Screenshot of the 'Little Albert/fear conditioning' exercise. (a) The student clicks on the 'start' button to begin the animation. The rat and the infant move towards each other and the infant reaches out for the rat; (b) The student clicks on the start button again to begin the second part of the animation. A figure behind the infant is animated and bangs two objects when the rat approaches the infant. The animation is accompanied by sound- the beating of the two objects and the infant's crying.

The experiment is famous for being the first to demonstrate fear conditioning in humans under laboratory conditions. At the age of nine months, a healthy infant called Albert B was shown to have no fear of live animals such as rats and rabbits (Albert is forever known in textbooks as Little Albert). Watson and Rayner attempted to condition fear of a previously unfeared object (a white rat) in Little Albert by pairing it with a feared stimulus (the noise of a claw hammer hitting a steel bar). They paired the rat with the noise seven times in two sessions, one week apart. When the rat was presented on its own, Albert became distressed and avoided the rat. Five days later, Albert was exposed to a number of other objects such as familiar wooden blocks, a rabbit, a dog, a sealskin coat, white cotton, the heads of Watson and two assistants and a Santa Claus mask. Albert showed a fear response to the rabbit, the dog and the sealskin coat. The initial conditioned response had generalised to some objects but not to others.

The exercise based on this study asked for the experimental conditions to be animated so that each of the behavioural stages described above would appear as separate animations (rat approaching a contented infant; the infant's crying on hearing the noise made by the collision; the association between the appearance of the rat and the sound of the noise; the rat alone producing distress). The animation included an audio file so that the collision between hammer and bar, and the child's crying, would be audible. After each stage, students would click a button to move onto the next animation. After all animations had been presented, the student would then answer questions based on what they had seen.

The exercises were presented in manageable 'chunks' so that cognitive fatigue would not easily set in and so that students could pace themselves. This was based on sound psychological research indicating that spaced practice is vastly superior to massed practice. It also adhered to Schweizer's (1999) suggestion that on-line courses be designed according to the performance-based model for curriculum design. Each topic, if completed from beginning to end with no break, would take between one and four hours to complete.

In Topic 1 (Introduction to Psychology), for example, our aim was to introduce the student to the discipline of psychology, its history, its major figures, its major schools of thought, and the scientific method. We therefore prioritised a series of topics and interactivities we felt were most important at this level. The student needed to be aware of the different branches of psychology and the types of psychologist, of the danger of making common-sense mistakes when assessing psychological studies, of the major themes and ideas in the history of the discipline, and those who proposed them and why. We also included an interactivity based

on one of the pedagogical features of the book (Cutting Edge, a boxed off section describing a new, novel or important study or series of studies). The one we chose was 'How to detect a liar', which became 'To Catch a Thief', because this is an interesting topic and is also one that has, until recently, been poorly studied and understood. It also illustrates some of the best psychological work on a difficult subject and shows how the scientific approach can be used to contradict common sense or 'conventional' wisdom.

It described and assessed recent research into the psychology of deception. The interactivity revolved around a police officer's description of the behaviour of people who had witnessed a crime. The student's task was to read the descriptions of the behaviour of two men and two women and then to decide whether one or other person (or both) was telling the truth or lying. Figures 2a and b illustrate the exercise. The aim of the exercise was to test students' knowledge of recent research indicating that the cues that lay people typically regard as characteristic of lying are not accurate, and that other behavioural cues are more predictive of genuine deception.

Figure 2a

**To Catch a Thief**

Here is a series of reports of witnesses to a theft. The police officer, who took details from the witnesses and made notes about their behaviour, suspects that one of them is not telling the truth. By reading the officer's descriptions of the witnesses' behaviour, see whether you think one, both or neither is/are telling the truth.

**Jane** 

The witness was co-operative but clearly very nervous. She had to be prompted to give answers and shifted her posture frequently during the interview. She gesticulated a lot, too. Her answers were very convincing although she made little consistent eye contact.

**Joanne** 

The witness was friendly and appeared very open and at ease. During the recall of the theft, she provided a very detailed account. I noticed that she would touch her hair and mouth repeatedly throughout the interview; she would often conceal her mouth with her hand, although her voice was clear and calm throughout. When challenged about some of the detail, she appeared defensive and would hesitate when responding.

Choose which one you think is correct:

Jane is lying     Joanne is lying     Neither is lying

**To Catch a Thief**

The police officer also took statements from two more witnesses. Again, by reading his notes, do you think that one of them might be lying?

**Bill** 

The witness was very co-operative and appeared at ease. He maintained eye contact at all times and I noticed he held his hands in his lap throughout the interview. At times, I noticed that his voice would rise when I asked specific questions. His posture would shift throughout the course of the interview.

**Ben** 

The witness appeared nervous, with his voice rising and falling as the interview progressed. He appeared twitchy and would frequently scratch his head, nose or the back of his hand. Although he tried his best to maintain eye contact, he would often fail and would look around him when answering many questions.

Choose which one you think is correct:

Bill is lying     Ben is lying     Both are lying     Neither is lying

**Figure 2b**



*Figure legends*

Figures 2a-b. The 'To Catch A Thief' interactivity. (a) Screenshot of the exercises on lying cues; (b) The feedback given to students once the exercise had been completed.

Eight interactive exercises comprised the majority of Topic 1 (with pit stop MCQ exercises and other pedagogical features inserted along the way) and we were conscious of the fact that this introductory topic may be perceived as one of the driest, dealing as it does with general psychology, its history and its development. We, therefore, designed these exercises to be as interactive as possible. One exercise required the student to match the sub-branch of psychology with its subject matter by using the drag and drop format. Another presented the student with true or false questions about psychological subjects (based on a published questionnaire). This tested the student's knowledge of whether psychology was common sense (all the answers were false but research shows that most people believe the statements to be true because they seem obvious, trite and, essentially, common sense). Students answered by clicking buttons on screen and clicking a 'Submit' button at the end. The exercise then goes on to describe and explain the research conducted on the topic of psychology and common sense and asks

students to think about their answers and why they gave them.

In another exercise, the student's knowledge of the leading historical figures in psychology, their associated schools of thought and the chronology of these schools was assessed. We tried to make this, a fairly standard and typical exercise for an introductory psychology chapter, a little more interesting by having students place the schools of thought in the correct order by dragging and dropping the names (listed on one side of the web page) onto the spines of a pile of books located next to the list (see Figures 3a, b and c). A second exercise asked students to match the school of thought with the appropriate pioneer, again by dragging the name onto the spines of the books (see Figures 4a, b and c). If the answers were incorrect, the name/term would 'bounce back' to the list of alternatives. If correct, the name would remain on the spine.

Figure 3a

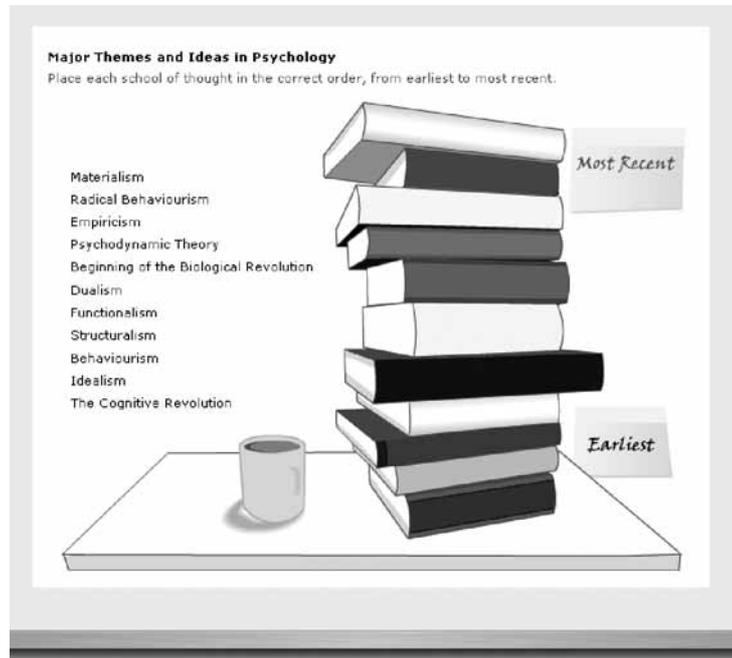


Figure 3b

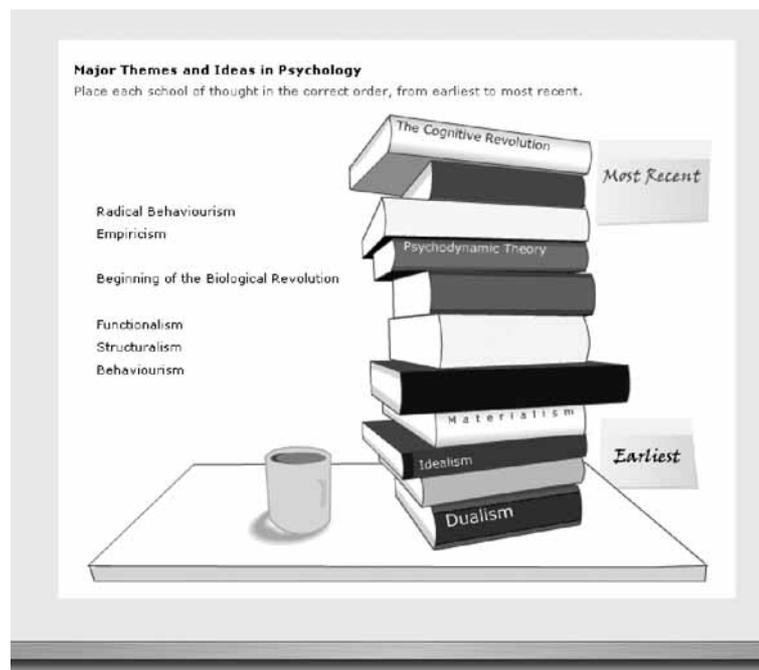


Figure 3c

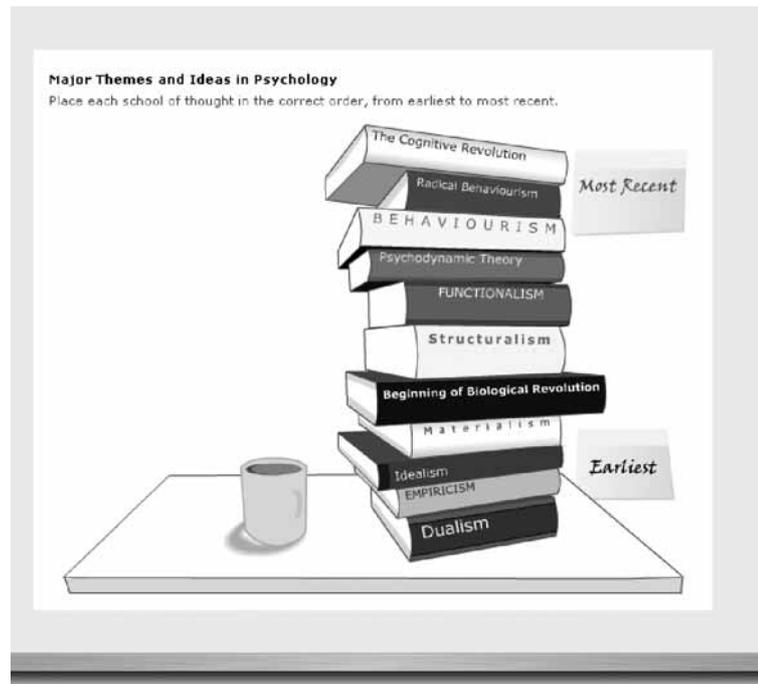


Figure legends

Figures 3a-c. The 'Major themes and ideas in psychology' interactivity. (a) the opening page of the exercise in which students are presented with a list of the major Schools in psychology together with a book tower onto which they can drag and drop the names of these Schools; (b) an example of a partially-complete exercise; (c) what the exercise looks like correctly completed (the names bounce back to the list if not placed in the correct place on the book tower).

Figure 4a

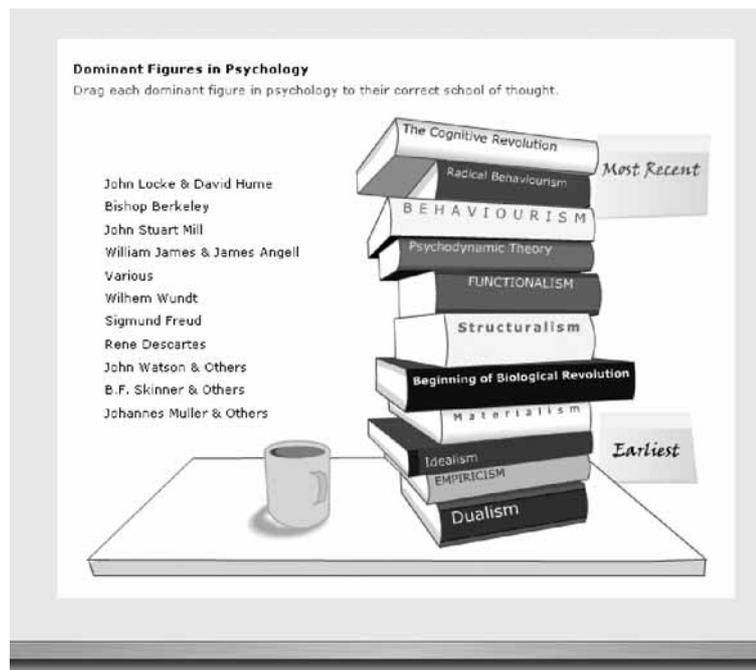


Figure 4b

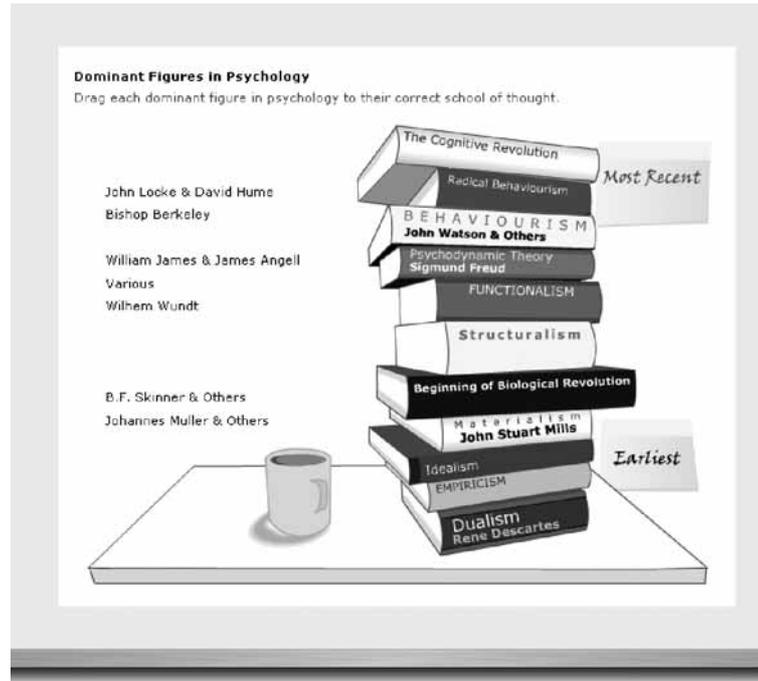


Figure 4c

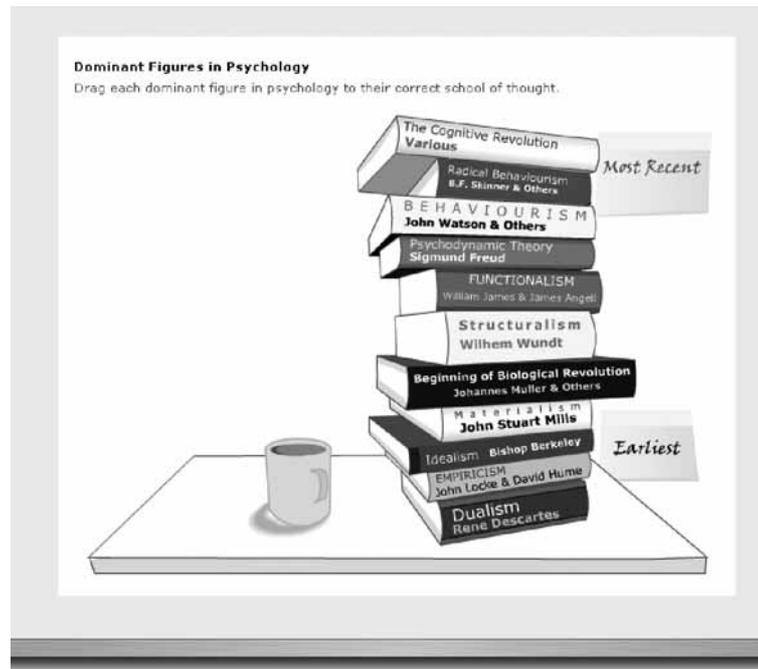


Figure legends

Figures 4a-c. The ‘Dominant figures in psychology’ interactivity. (a) the opening page of the exercise in which students are presented with a list of the major figures in psychology together with a book tower onto which they can drag and drop the names of these figures next to the School they pioneered; (b) an example of a partially-complete exercise; (c) what the exercise looks like correctly completed (the names bounce back to the list if not placed in the correct place on the book tower).

One of the more intensive exercises had students acting as the research manager of a series of projects (five of them). A project description was presented and then the options 'categories of staff' and 'contribution of staff' appeared underneath. The student's role was to match the appropriate psychologist (staff) to the appropriate area of study (contribution), using drag and drop. This allowed students to see how specific types of psychologists contribute to the study of behaviour, and tested their knowledge of the sub-areas of the discipline.

Each topic in the course was designed using a generic format, adapted according to subject. Table 2 shows the generic sections and their aims. Table 3 provides an example of the major headings and structuring for two of the chapters (Sensation, and Social Cognition and Attitudes).

**Table 2:** The generic heading structure of the course

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### **Topic at a glance**

This section gives an overview of the topic.

### **Introduction**

This section provides a brief introduction to the topic. It lists a series of aims for the topic and describes the areas of knowledge and understanding examined.

### **Interactivities in this topic**

This section provides a list of all the major interactivities in the topic

### **Are you ready?**

This section tests whether students are ready to tackle the topic. They should have read the relevant chapter from Carlson, Martin and Buskist's *Psychology* (Second European Edition) and there are ten multiple choice questions or true/false questions for them to attempt. If they get all or most of these correct, they are ready to tackle the topic. If not, they need to go back to the chapter and read the relevant parts again.

### **The topic**

The topic comprises various interactive exercises with many more mini-exercises within these. It allows the student to self-assess knowledge and understanding of the major branches of psychology. At various points along the topic, there are pit-stop exercises which allow the student to review his/her understanding of the material covered at that stage.

### **Topic review**

This section summarises the knowledge and understanding the student should have attained by the end of the topic.

### **Further reading**

An extensive list of books, book chapters and journal articles is included per topic.

### **Journals to consult**

This section lists the most important journals in the area covered by the topic.

### **Websites**

This section provides a list of topic-relevant web sites for the student to explore.

### **Essays**

There are three or four essay questions in this section for the student to attempt. Guidance notes are provided.

### **Web exercises**

These are included to assess the students' ability to use the Internet to seek out, or answer questions about, psychological research.

### **Chat room topics**

In this section, students can discuss controversial questions in psychology and debate issues of importance in psychological research.

### **Assessment questions**

These questions (multiple choice and true/false) assess the student's understanding of the entire topic. The answers can be sent directly to the tutor; the software provided to the tutor allows automatic marking of the assessment questions.

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**Table 3:** The contents of the Topics on Sensation (Topic 5) and Social Cognition and Attitudes (Topic 15)

<b>Sensation</b>	<b>Social cognition and attitudes</b>
Sensation- Topic at a Glance	Social Cognition and Attitudes - Topic at a Glance
What you should be able to do at the end of the 'Sensation' topic	What you should be able to do at the end of the 'Social Cognition and Attitudes' topic
Are you ready?	Are you ready?
Interactivity 1: Psychophysics and thresholds	Interactivity 1: Who am I?
Interactivity 2: An experiment in thresholds	Interactivity 2: Social judgements
Interactivity 3: Detecting signals	Interactivity 3: Impression formation
Interactivity 4: A simulation of signal detection	Interactivity 4: The story of George and Vance
Pit-stop MCQ	Interactivity 5: The actor-observer effect
Interactivity 5: The eye, its parts and its functions	Interactivity 6: The fundamental attribution error
Interactivity 6: The visual cortex	Interactivity 7: Attributions and the false consensus effect
Interactivity 7: Colour mixing	Pit Stop MCQ
Interactivity 8: After images	Interactivity 8: The false consensus effect- what's your opinion?
Interactivity 9: Defects in vision	Interactivity 9: Stereotyping
Interactivity 10: Introduction to sound	Interactivity 10: Stereotyping and prejudice
Interactivity 11: Frequency and amplitude of sound waves	Interactivity 11: Cognitive dissonance
Interactivity 12: The ear, its parts and its functions	Interactivity 12: Self-serving bias
Interactivity 13: Responses to sound waves	Interactivity 13: Attitude formation
Interactivity 14: The senses of smell and taste	Interactivity 14: Birds of a Feather?
Interactivity 15: Manipulating your sense of smell	Pit Stop MCQ
Interactivity 16: The somatosenses	Topic Review
Pit-stop MCQ	Essays
Topic Review	Web Exercises
Suggestions for further reading	Suggestions for further reading
Sensation: General reading	Social psychology in general
Vision	Self
Audition	Culture and social psychology
Somatosensation	Social cognition and attitudes
Olfaction and gustation	
Journals to consult	Journals to consult
Website addresses	Website addresses
Essays	Chat room Topics
Web Exercises	Assessment Questions
Sensation	
Synaesthesia	
Sense of taste	
Chat room Topics	
Assessment Questions	

## From conception to execution

The course's original written material was uploaded directly into Phrase, a software template designed for web-based courses. This is a rigidly structured format which, for example, has a template for multiple choice questions in which a box or table is provided for the insertion of questions, options, and answers/feedback. There are similar templates for other types of exercises, such as true/false questions, the selection of the correct response to a question from a drop down menu of options, and drag and drop (in which items are dragged from one part of the page to another). This has the advantages that the web developer can take these formatted files and create the course directly from them; it significantly speeds up processing at the post-authoring stage. Its disadvantage, however, is that it is a laborious and monotonous process for an author. It is also restrictive if the course requires more than basic pedagogical features such as multiple choice questions, drag and drop and so on. Our course required variants of the drag and drop where, in Topic 4 for example, a brain would be presented together with a list of brain functions. The student's task would be to place the functions correctly onto the brain regions mediating them by using their mouse/tracker and then answering the relevant question that would appear only once the label had been correctly positioned. This was not possible in Phrase because it cannot prompt a question to appear from any label positioning. For many of our interactivities, therefore, we provided text descriptions for the web developer to work on. Also, to speed up the authoring process, about half of the material that could be formatted in Phrase was completed by the electronic content development editor.

In some instances, we were able to call on existing resources published by Pearson or its companies (such as Allyn & Bacon). One such resource was *My Psych Lab*, an American product which provides access to on-line materials, via an access code, linked to a range of Pearson/Allyn and Bacon texts (see [www.mypsychlab.com](http://www.mypsychlab.com)). There were two American psychology textbooks which featured on-line interactivities, audio files or video created for those books, and we were able to select those we thought best enhanced our course and/or illustrated concepts well. It also meant we were able to avoid repeating pre-existing exercises. As an indicator of the way in which on-line course authors think and work, we discovered that we had many ideas in common and that some interactivities could be imported directly. Our on-line course now forms part of the *My Psych Lab* package and students access a pack that provides them with a password which they use to log onto the website [www.coursecompass.com](http://www.coursecompass.com) where the on-line course appears. In addition to the course itself, *My Psych Lab* will have the following features for students of the book and course:

- Announcements page
- Multiple Choice quizzes
- Other question types (such as Categorisation, Matching, True/False, Multiple Answer, Essay questions)
- Interactive Flash exercises (including some with audio). These come in many different forms.
- Diagnostic testing: a student completes multiple choice questions and a study plan is subsequently generated for them based on these results. Students will be referred back to parts of the book (A-heads and page references) which they need to revisit. (The multiple choice questions are linked to A-heads in the book with MathXL software)
- E-book: a PDF version of the book will be available online.
- Glossary
- Discussion Boards
- Email facility for tutor
- Web links

The significant interactivities were all completed in Macromedia Flash, and designed by a contracted web developer. The project was completed in Course Compass using Blackboard, an on-line course management system. The electronic content development editor (ECDE) read through all chapters, extracted the suggestions for interactivities, and assessed each one in terms of the concept it was illustrating and in terms of the budget available. The cost of each interaction (or animation) differed, depending on the complexity of programming involved, or the illustrations. One of the more involved examples (the Little Albert experiment described earlier) cost approximately £210.

The ECDE re-wrote each interaction in the form of a brief for the web developer. She suggested what content might go on each screen, illustrations, buttons, feedback, etc.

The process produced a total of around 70 briefs for the developer who then completed first drafts of each interaction. Each interaction was checked for functionality (whether it worked and did what it was intended to do) and was copy-edited. The developer submitted second drafts, which were checked by the ECDE. After the web developer had made second round revisions, they were re-checked.

## Some limitations

This course, and others like it, is - of course - limited by the hardware and software used by the student or university. Unreliable technology is the bane of any academic and student and so the system used has to be robust enough for the student to work through the course uninterrupted. Some interactivities required specific pieces of software to enable audio or visual files to work (such as Macromedia Flash). While most well-maintained computer systems will feature this software, older machines running old software may have difficulty coping with the demands of some interactivities. However, standard on-line courses using Phrase and not using illustrations should be able to cope adequately with the material. The technical requirements for the course can be found in appendix A.

The use of on-line courses is also dictated by their users and one criticism of the format has been the short length of time that students spend on them. In one study, for example, the time spent on an on-line cognitive psychology course varied from 6.69 hours to 11.96 hours (Taraban, Rynearson and Stalcup, 2001). Students over-estimated the time they spent on the modules by 100%: the computer tracked actual usage. It is important, therefore, that there be some method of ensuring that students spend an adequate length of time on the courses they study. One way of doing this is to provide a comprehensive number of exercises where the student is expected to provide some form of reflective feedback (as part of the course assessment) or where the answers might be forwarded to their tutor.

A pedagogical question concerns the type of student who could most benefit from such a medium of teaching. Most academics would, in all likelihood, assume that the majority of students would cope with any format of presentation (whether classroom lectures or on-line courses), but little research exists to test this hypothesis. Some authors (e.g., Upton and Cooper, 2001) have drawn on evidence from other researchers showing that success on such courses is related to the student's learning style and their expectations of teaching. There is a positive correlation between learning style and some types of course success but it is unclear whether those students with the more adaptive learning style are simply generally more adept at approaching their study, or whether a specific learning style benefits studying via the Internet.

## How feasible would it be to create a non-commercial on-line course?

Not all tutors are in the fortunate position of being able to exploit the personnel and financial resources of a large publishing company and this is an important point that requires emphasis. The obvious question, therefore, is

how easy would it be for a tutor to set up a similar on-line course without these resources? The existence of university on-line courses already suggests that this lack of resources is no obstacle to the creation of this kind of pedagogy. Indeed, if an author/tutor used the Phrase template and did not require any complex interactivities or illustrations, such a course would be extremely easy, if time-consuming, to create. The templates are already provided in Phrase and the Phrase files can easily be uploaded onto the Blackboard system. A tutor could upload a variety of html files and Blackboard would understand and present them as long as the html files were complete and bug-free. Pearson, for example, uses Phrase because authors can use this easily to create different question types, and because it makes the transition from author manuscript to camera-ready files quicker. It is a simple process of using Word documents to export into html files without needing the assistance of an html editor or a programmer. Complications would arise if the text was extensive, if Phrase was not used properly or if the course required illustrations from the accompanying course book that the tutor would have to source and possibly request permission to reproduce.

The most serious cost of undertaking such a project, however, is not essentially financial but temporal and cognitive. The course took the two authors, who are full-time academics and researchers, approximately six months to develop. In this period, we created new exercises, modified existing ones, updated others and devised new assessment materials. We wrote or revised nine chapters/topics each. If done intensively, such a project can be completed relatively swiftly. This course has the advantage of being tied to a specific text and the text could, therefore, guide the types of exercise we created and help to generate the more important activities we wished users to try. However, if an author cannot ensure such focus or devote a portion of time to such intensive work, such a project could be significantly more time-consuming. The gestation and execution is very similar to that undergone when an author writes a book: it requires meticulous, yet ultimately flexible, timetabling, self-discipline and a recognition of the degree of work involved. It is important to note that the work does not end when the course has been created because the material then needs to be proofread - not simply the text but all of the options that the software presents the user (such as multiple choice questions' feedback) and the interactions.

## Conclusion: are on-line courses the way forward?

It is an almost inescapable psychological truth that people will need some form of human contact to help resolve a problem or to deflect feelings of loneliness engendered by enforced detachment. This is why any on-line course cannot be truly human-free. There needs to be enough interactive human support in the package so

that students do not feel 'out on a limb'. On-line courses, therefore, need to be constructed with tutor contact included as part of the package. Students need to be aware that they can contact their tutor, or other students, at any point in their study. On-line courses, including ours, allow this facility. It offers tests at the end of each chapter/Topic. These can be instantly graded on-line and the student has the option of emailing the results directly to their tutor. The course also offers other avenues for communication, such as emailing tutors and other students, participating in chat sessions and engaging in message boards, all of which can enhance the student's learning experience.

The advantages of well-developed on-line courses are that they provide a new and novel way of teaching, that learning is active rather than passive, that the pace of learning is ultimately dictated by the student, and that learning can take place wherever the student has access to the Internet.

Some disadvantages are that on-line courses are very time-consuming to produce - as noted in an earlier section, the first two authors spent over six months planning, developing and writing the 18 topics in the course. Their use also depends very much on the individual student (there is no way of guaranteeing that a student will spend the time you expect him/her to spend on a topic on a course).

Such courses might, in addition, be regarded as 'easy options' for universities and academics, in that it seems to remove the tutor directly from the process of teaching. However, as we have made clear, tutor support for the student throughout the completion of such courses is more, not less, important for students being taught via this medium. The tutor is also vital for the revision and re-vivification of the material on a monthly, bi-annual or annual basis. Once created, such a course cannot be used unmodified, indefinitely.

Although initially time-consuming to create, once developed, an on-line course for university and college students can provide a solid and substantial medium for the user to learn about a given discipline. The accessibility of such material can open up academia to a vast, new and potentially receptive audience.

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## Appendix A

CourseCompass works effectively with Windows 2000 and Windows XP, and with Macintosh 9.2 and OS 10 and above and so this software needs to be installed before the course can run. As far as we are aware, no cross-platform issues have been identified (Mac OS vs Windows), although Diagnostic Testing can only currently work in a Windows environment. It also requires an Internet connection speed of at least 28.8 kilobits per second- the faster the connection, the faster the pages will load- and the latest browser software (in order to allow for the best performance). In order to view some material, the user might also need to download various items of software but some plug-ins may not be supported by Explorer V5.5. SP2 or higher. The most commonly used items of additional software are: Adobe Reader, Apple Quicktime (for video and streamed media and audio files, including Flash), Java Plug-In (this is needed to view the Virtual Classroom and the Lightweight Chat sessions), Macromedia Flash, macromedia Shockwave (needed to run some animations), RealNetworks RealOne Player (needed to hear music or streamed media animations), Math XL (which allows on-line diagnostic testing) and TestGen Plug-In (required for the student to view and take some of the online tests in CourseCompass).

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# Alcohol expectancies, coping and mastery in the prediction of drinking to cope, alcohol use and alcohol problems

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## Abstract

**Objective:** To examine the influence of perceived mastery, cognitive and behavioural coping and expectancies in the prediction of patterns and alcohol use and misuse.

**Methodology:** Within a cross-sectional, self-completion survey, 187 University students (59% female) completed scales measuring perceived mastery, general and alcohol use coping behaviours, alcohol expectancies, alcohol consumption and the Alcohol Use Disorder Identification Test (AUDIT).

**Results:** Results are reported and discussed in terms of three multiple regression analyses, predicting the use of alcohol to cope, alcohol consumption and AUDIT scores. Alcohol expectancies ( $p < .001$ ), age ( $p < .001$ ), devaluation coping and the interaction between gender and accommodation coping ( $p < .01$ ) were found to significantly predict the use of drinking to cope. In terms of alcohol consumption, the significant predictors were age and gender ( $p < .001$ ), expectancies ( $p < .05$ ), drinking to cope ( $p < .001$ ) and accommodation coping ( $p < .05$ ). In the third equation, predicting AUDIT scores, significant main effects were observed for age ( $p < .001$ ), alcohol expectancies ( $p < .001$ ), alcohol consumption ( $p < .001$ ) and drinking to cope ( $p < .01$ ), with additional contributions from the interaction between gender and avoidance coping ( $p < .05$ ).

**Conclusions:** The findings support previous work within the Social Learning Theory approach, particularly highlighting the role of alcohol expectancies and coping in predicting outcome. The findings extend support for the role of moderating effects, particularly involving coping. The adoption of repeated measure methodologies to clarify predictive relationships is recommended.

## Keywords

Alcohol; coping; Social Learning Theory; AUDIT.

## Introduction

Alcohol-related problems continue to be a serious cause of physical and psychological ill health across many developed countries. Traditional models of addiction have assisted in the development of a wide range of intervention strategies from education to therapeutic environments. However, there continues to be debate on the overlap between substance-focused disease models, behaviourally oriented substance-focused models and more general models of psychological well-being. Previous research has highlighted the potential benefits of utilising wider psychosocial perspectives to drinking and problem drinking behaviour (Brennan & Moos, 1991; Cooper *et al.*, 1988). Several studies have shown that viewing drinking as one of a potential range of coping behaviours has utility in predicting alcohol consumption (Abbey *et al.*, 1993; Cooper *et al.*, 1988) and problem drinking patterns (Cooper *et al.*, 1988; Farber *et al.*, 1980).

Social Learning Theory has allowed substance use to be conceptualised as a coping behaviour which is supported by positive expectancies but is essentially maladaptive in outcome. These patterns of substance use may then become reinforced and habitually chosen over alternative adaptive coping strategies (Abrams & Niaura, 1987). In a detailed investigation within the framework of Social Learning Theory, Cooper *et al.* (1988) identified significant associations between alcohol use coping and alcohol expectancies as well as dispositional avoidance coping and suppression / avoidance of dealing with anger. At subsequent stages in this study, Cooper *et al.* demonstrated the significant role of drinking to cope with stress in predicting alcohol consumption and, more importantly, alcohol misuse. They concluded that the use of concepts underlying the stress, appraisal and coping process was likely to provide insight into the genesis of alcohol abuse.

The research described by Cooper *et al.* (1988) has been extended by studies on young adults (Evans & Dunn, 1995) and on adolescents (Laurent *et al.*, 1997). Evans &

Dunn (1995) demonstrated support for the findings reported by Cooper *et al.* (1988) and generally favoured the Social Learning Theory approach. The importance of alcohol expectancies to the prediction of alcohol problems was emphasised as well as the demonstration of links between alcohol expectancies and gender in the prediction of alcohol consumption. Laurent *et al.* (1997) extended the work of Evans & Dunn (1995) by increasing the focus on main and interaction effects of gender in predicting alcohol consumption, alcohol coping and alcohol problems among a sample of young adolescents. Again the importance of alcohol expectancies to the prediction of consumption, coping and problems involving alcohol were demonstrated. Other results surprisingly indicated that there was not a significant contribution of gender to the prediction of alcohol consumption either as a main effect or as part of an interaction term. However, as 50% of Laurent *et al.*'s samples were under 16 years of age, their results may simply reflect the lack of established drinking patterns across their sample, rather than anything more interesting.

Generally there seems to be agreement among studies that drinking to cope clusters with certain types of coping behaviours, though there is variation in terms of the labels attached to such coping dimensions. Several studies link alcohol use coping to smoking, eating and shopping (e.g. 'symptom management', Latack, 1986). Alcohol use coping was also found to be associated with 'avoidance coping' by Cooper *et al.* (1988) though these dimensions also contained 'symptom reduction' behaviours such as smoking. Some of this variation reflects methodological differences and may relate to different reasons for drinking. For example, Farber *et al.* (1980) suggests alcohol use as a direct symptom management coping strategy and alcohol use as a part of social support seeking coping behaviour. In addition to links between alcohol use and coping behaviours, a number of authors have suggested that perceptions of control are associated with substance use and misuse (e.g. Haynes & Ayliffe, 1991; Seeman & Seeman, 1992). Thus, an extension of the studies described by Cooper *et al.* (1988), Evans & Dunn (1995) and Laurent *et al.* (1997) could include control-related perceptions as well as an expanded range of coping behaviours. The present study attempts to do this while also considering the potential moderating influence of gender and expectancies on the relationship between coping and alcohol use and misuse.

## Methodology

### Sample

Two hundred and sixty-one questionnaires were administered to classes of undergraduate research methods students studying human and health science topics (e.g. sports science, health studies and psychology). The questionnaire was completed

anonymously on a voluntary basis and conformed to the procedures governing ethical standards in research applied at the host university.

### Measures

The study utilized a self-completion questionnaire comprised of several well-established, published measures. The main sections of the questionnaire are described in the following sections.

*Demographic information.* Information was obtained on several biographical variables including age and gender (1=male, 2=female).

*Habitual alcohol consumption.* This section was designed as a means of gaining detailed information concerning the habitual alcohol consumption patterns of respondents. Respondents were asked to report both the type and amount of alcoholic beverage typically consumed over a seven-day period. This information was then converted to represent the units of alcohol consumed, where each unit was roughly equivalent to a drink containing approximately 10mls of alcohol. Thus a double measure of whisky, gin or vodka may equate to 2 units, as would a single pint (568 mls) of medium strength lager or beer.

*Drinking to cope.* The consumption of alcohol as a means of coping was assessed using the drinking to cope scale (Polich & Orvis, 1979). This is a 6-item scale whereby respondents report the frequency with which they use alcohol to cope with or manage negative emotions ("to cheer up when you're in a bad mood" or "to help when you feel depressed or nervous"). Each of the 6 items is assessed along a 4-point frequency scale ranging from "almost never" (coded as 1) to "almost always" (coded as 4).

*Coping in general life.* The 20 item version of the Cybernetic Coping Scale (CCS, Edwards & Baglioni, 1993) with an additional 4 items from the Ways of Coping Check-List (WCCL, Lazarus & Folkman, 1984), was incorporated to yield the reported frequency of coping strategy use in general. These items were selected to represent the CCS dimensions of changing the situation (e.g. 'I focus my efforts on changing the situation'), accommodation (e.g. 'I try to adjust my expectations to meet the situation'), devaluation (e.g. 'I tell myself that the problem was unimportant'), avoidance (e.g. 'I try to avoid thinking about the problem'), and symptom reduction (e.g. 'I try to let off steam'). The remaining four items from the WCCL represented social support seeking (e.g. 'I accept sympathy and understanding from someone'). Each item was graded on a five-point frequency scale, according to how often the respondent used a particular method to cope with the problems in their general life, with the scale ranging from 'never' (coded as 1) to 'always' (coded as 5).

*Control in general life.* The 7-item Mastery scale of Pearlin & Radabaugh (1976) was included in an attempt to identify perceptions of control over general events (as opposed to just alcohol-related situations). Respondents were asked to identify their level of agreement with the items using a four point Likert-type scale ranging from "1=strongly agree" to "4=strongly disagree". Thus, a high score on each item of this scale represented a greater degree of perceived personal control.

*Harmful and hazardous alcohol consumption.* The Alcohol Use Disorders Identification Test (AUDIT) was developed by the World Health Organisation (WHO) as a means of identifying individuals whose alcohol consumption is harmful or hazardous to their health. AUDIT was originally designed for use as a screening tool to detect harmful and hazardous alcohol consumption in a primary health care setting (Babor *et al.*, 1989; Saunders & Aasland, 1987) although it has been utilised for the detection of problem drinking in other populations, such as college students (Fleming *et al.*, 1991; Larsen, 1994), service industry personnel (Larsen, 1994) and the long-term unemployed (Claussen & Aasland, 1993). The 10-item AUDIT scale is a sensitive indicator of hazardous alcohol intake (Saunders *et al.*, 1993) and alcohol abuse and dependence (Claussen & Aasland, 1993; Fleming *et al.*, 1991). The 10-item scale taps into the frequency of alcohol consumption (items 1-3), dependence symptoms (items 4-6), adverse reactions to alcohol consumption (items 7-8), and indicators of harmful alcohol consumption (items 9-10). Each of these items was graded along a 4-point scale, yielding a final total of between 0 and 40.

*Alcohol expectancies.* Positive alcohol expectancies were assessed with the abbreviated version of the Alcohol Effects Questionnaire (Rohsenow, 1983). This scale utilised the combination of six items assessing expectancies for global positive effects, social and physical pleasure, sexual enhancement, aggression and power, social expressiveness, and relaxation and tension reduction. For example respondents were asked to indicate agreement with statements such as 'Drinking makes the future seem brighter' and 'If I have a couple of drinks it is easier to express my feelings'. Respondents assessed each of the six items on a two-point scale ('disagree' or 'agree') and responses were summed across the scale. A high score reflects agreement with more positive statements about the effects of alcohol consumption.

### **Procedure**

Cross-sectional data were collected over a 3-week period corresponding to weeks 4, 5, and 6 of the second University academic semester. Data were collected by means of a self-completed questionnaire administered in

a classroom setting after the lecture. The response to the questionnaire was voluntary and subjects were given written assurance that all individual data would be treated confidentially. All data were analysed using the Statistical Package for the Social Sciences (SPSS).

## **Results**

### **Sample description**

In total 190 questionnaires were completed and returned (a response rate of 72%). Three subjects were excluded from this sample because they provided incomplete data on a large proportion of the questionnaire. Thus, statistical analysis was performed on a sample of 187 respondents. The mean age of respondents was 24 years (sd 7.5) with approximately 53% of the sample aged 18-21, 25% aged 23-30 years and 15% aged over 30 years. Fifty-nine percent of the samples were female.

### **Scale descriptive statistics**

The scale means and standard deviations as well as measures of internal consistency (Cronbach's alpha coefficients) are presented for each of the scales in Table 1. As can be seen, the majority of the scales have reasonable levels of internal consistency. It was found that the alpha for the accommodation coping scale was improved by the removal of one item (from  $\alpha=.57$  to  $\alpha=.67$ ). The low consistency observed for the alcohol expectancies scale ( $\alpha=.52$ ) could not be easily rectified and was felt to reflect the nature of the instrument in that expectancy domains need not be highly inter-related. It was, though, felt that such expectancies could still logically have a cumulative impact on behavioural tendencies and the items remained summed.

**Table 1:** Scale means  $\pm$  SD, measures of internal consistency (Cronbach's alpha) and correlation coefficients for each of the scales used (NB sample size = 162, key a:  $p < 0.05$ ; b:  $p < 0.01$ ; c:  $p < 0.001$ ).

	1	2	3	4	5	6	7	8	9	10	11	12	13
<b>alpha</b>													
1. Alcohol Consumption	-												
2. Drinking to Cope	.37c	<b>.74</b>											
3. AUDIT	.64c	.51c	<b>.79</b>										
4. Alcohol Expectancies	.19b	.39c	.37c	<b>.52</b>									
5. Gender	-.32c	.13	-.13	.05	-								
6. Age	-.23b	-.25c	-.36c	-.11	.02	-							
7. Mastery	.11	-.09	.06	.06	-.19b	-.02	<b>.77</b>						
8. Changing the Situation	.02	.03	-.01	-.06	.08	.10	.22b	<b>.73</b>					
9. Accommodation	-.09	.06	-.06	.01	-.10	.11	-.16a	.15a	<b>.67</b>				
10. Devaluation	-.06	-.02	-.01	.19b	.05	.04	-.04	-.02	.26c	<b>.87</b>			
11. Avoidance	.00	.18a	.13	.15a	.01	-.12	-.21b	-.17a	.19b	.46c	<b>.82</b>		
12. Symptom Reduction	.01	.06	.03	-.04	.02	.02	-.04	.27c	.28c	.08	.04	<b>.71</b>	
13. Seeking Social Support	-.06	.05	.01	-.06	.26c	.01	-.07	.22b	.15a	-.13	-.09	.42c	<b>.77</b>
Mean	18.56	1.76	10.32	1.61	1.59	24.10	3.06	3.41	3.07	2.95	2.85	3.55	3.51
S.D.	15.34	0.55	6.00	0.27	0.49	7.63	0.46	0.55	0.52	1.00	0.77	0.66	0.73

### ***Distribution of AUDIT scores***

Some debate is evident in the literature as to the ideal cut-off point for the AUDIT questionnaire (Conigrave *et al.*, 1995). Using a cut-off score of 11, Saunders & Aasland (1987) correctly classified 80% of participants with hazardous alcohol consumption and 89% of participants with a non-hazardous intake. Babor *et al.* (1989) showed a greater sensitivity in the prediction of harmful and hazardous alcohol consumption with a lower cut-off score of 8. Claussen & Aasland (1993) maintained the use of a cut-off score of 10-11 but in addition used two other cut-off points of 8-9 to indicate hazardous consumption and 18-19 to indicate harmful consumption.

The results in the present study indicated that 37% of the respondents (46% males and 30% females) would be classified as a positive case if using a cut-off score of 11. Furthermore, when using the cut-off points suggested by Claussen & Aasland (1993) it was found that 56% of respondents (68% males and 47% females) would be classified as having an alcohol consumption that was hazardous to health and 11% of respondents (15% males and 7% females) would be classified as having an alcohol consumption that was harmful to health. Detailed

examination of the item means for the AUDIT indicated that the high prevalence of positive cases was mainly based on responses to the first three items which focus on quantity and frequency of consumption rather than the experience of dependence symptoms, adverse reactions or indicators of harmful consumption.

### ***Inferential statistical procedures***

In order to facilitate comparison with previous studies, the inferential statistical procedures used were similar to those described by Cooper *et al.* (1988), Evans and Dunn (1995) and particularly Laurent *et al.* (1997). Hierarchical multiple regression analyses were used to predict the frequency of use of alcohol to cope, alcohol consumption and AUDIT total score. Following Laurent *et al.*, the inclusion of product terms at later stages in the analyses explored the potential contribution of interactions coping strategies with gender and alcohol expectancies to the prediction of the dependent measures.

### ***Prediction of alcohol coping***

In predicting drinking to cope, it was found that the equation accounted for 43% of the variation in scores

(see Table 2). The equation predicting drinking to cope revealed strong significant contributions from alcohol expectancies ( $p < .001$ ) and age ( $p < .001$ ) with the main effect of devaluation coping also significantly adding to the equation ( $p < .05$ ). There were significant contributions from the interaction between gender and accommodation coping ( $p < .01$ ), however, the main effect of gender was non-significant. From an examination of the simple effects correlations associated with the

significant gender x accommodation coping interaction, it was found that for males there was a negative association ( $r = -.18$ ) between alcohol coping and accommodation coping, whereas for females there was a significant positive correlation ( $r = .20$ ) between accommodation coping and alcohol use coping.

**Table2:** Multiple Regression Analyses Predicting Drinking to Cope, Alcohol Consumption and AUDIT (a:  $p < 0.05$ ; b:  $p < 0.01$ ; c:  $p < 0.001$ ).

Variable	Drinking to Cope		Alcohol Consumption		AUDIT	
	Change R <sup>2</sup>	Step Beta	Change R <sup>2</sup>	Step Beta	Change R <sup>2</sup>	Step Beta
Age	.087c	-.261c	.153c	-.221b	.143c	-.357c
Gender		.141		-.318c		-.117
Alcohol Expectancies	.140c	.366c	.035a	.184a	.116c	.343c
Mastery		-.119		.034		.004
Alcohol Consumption	NE	NE	NE	NE	<b>.301c</b>	.488c
Drinking to Cope	NE	NE	<b>.135c</b>	<b>.390c</b>		.213b
Changing the Situation	<b>.046</b>	<b>.099</b>		<b>.047</b>		<b>.002</b>
Accommodation		<b>.071</b>		<b>-.154a</b>		<b>-.024</b>
Devaluation		<b>-.190a</b>		<b>.027</b>		<b>-.014</b>
Avoidance		<b>.139</b>		<b>-.053</b>		<b>.060</b>
Reduction		<b>.061</b>		<b>.016</b>		<b>.013</b>
Seeking Social Support		<b>-.023</b>		<b>.037</b>		<b>.048</b>
Expectancies x Changing the situation	<b>.073a</b>	<b>-.144</b>	<b>.018</b>	<b>.054</b>	<b>.035</b>	<b>-.087</b>
Expectancies x accommodation		<b>.161</b>		<b>.096</b>		<b>.166</b>
Expectancies x devaluation		<b>-.188</b>		<b>-.094</b>		<b>-.078</b>
Expectancies x Avoidance		<b>.011</b>		<b>.145</b>		<b>.166</b>
Expectancies x Reduction		<b>.142</b>		<b>.082</b>		<b>.027</b>
Expectancies x Seeking Social Support		<b>-.051</b>		<b>-.081</b>		<b>.043</b>
Gender x Changing the Situation	<b>.084b</b>	<b>.153</b>	<b>.011</b>	<b>-.056</b>	<b>.041a</b>	<b>-.053</b>
Gender x Accommodation		<b>.231b</b>		<b>.007</b>		<b>.078</b>
Gender x Devaluation		<b>-.088</b>		<b>-.025</b>		<b>-.001</b>
Gender x Avoidance		<b>.091</b>		<b>.045</b>		<b>.157a</b>
Gender x Reduction		<b>-.149</b>		<b>-.082</b>		<b>-.001</b>
Gender x Seeking Social Support		<b>.006</b>		<b>.021</b>		<b>-.067</b>
Gender x Expectancies		<b>.158</b>		<b>.018</b>		<b>.085</b>
Final equation statistics	<b>R = .655, R<sup>2</sup> = .429, R<sup>2</sup><sub>ADJ</sub> = .338, F = 4.701, df<sub>23,144</sub>, p &lt; .001</b>		<b>R = .594, R<sup>2</sup> = .352, R<sup>2</sup><sub>ADJ</sub> = .239, F = 3.104, df<sub>24,137</sub>, p &lt; 0.001</b>		<b>R = .798, R<sup>2</sup> = .636, R<sup>2</sup><sub>ADJ</sub> = .569, F = 9.519, df<sub>25,136</sub>, p &lt; 0.001</b>	

### **Prediction of Alcohol Consumption**

In predicting alcohol consumption the final equation accounted for 35% of the variance in alcohol consumption scores within the sample (see Table 2). There were significant contributions from the main effects of age ( $p < .01$ ), gender ( $p < .001$ ), alcohol expectancies ( $p < .05$ ), drinking to cope ( $p < .001$ ), and accommodation coping ( $p < .05$ ). No significant interaction effects were observed.

### **Prediction of AUDIT scores**

The final equation predicting AUDIT total accounted for 64% of the variance in scores within the sample (see Table 2). Significant main effects were observed for age ( $p < .001$ ), alcohol expectancies ( $p < .001$ ), alcohol consumption ( $p < .001$ ) and drinking to cope ( $p < .01$ ). A significant interaction was observed between gender and avoidance coping ( $p < .05$ ). Detailed examination of the gender x avoidance coping interaction revealed that for females there was a significant positive correlation between avoidance coping and AUDIT scores ( $r = .19$ ), for males this correlation was non significant ( $r = .05$ ).

## **Discussion**

In assessing the range of alcohol use patterns within the current investigation, use was made of the screening instrument AUDIT, developed, with support, by the WHO. When using the cut-off points suggested by Claussen & Aasland (1993) it was found that over half of the respondents (68% males and 47% females) would be classified as having an alcohol consumption that was hazardous to health and 11% of respondents (15% males and 7% females) would be classified as having an alcohol consumption that was harmful to health. Although these figures seem very high (particularly for the male respondents), they bear a striking similarity to those reported by Harnett *et al* (1999) who reported that 68% of their sample of male drinkers aged 22-24 years scored above 8 on the AUDIT.

A closer inspection of the AUDIT item means revealed that medium to high scores influenced by responses to the first three items on the scale which reflect quantity and frequency of consumption rather than experiences of alcohol-related problems. It is possible then that these very high rates of hazardous consumption reflect some limitations within the instrument and its thresholds, particularly when applied to student populations. Clearly, though, there remains the view that the results indicate levels of hazardous and harmful alcohol consumption that would cause some concern if they were reflected across the wider student population. Recent reviews (Hams & Hope, 2003) have highlighted problem drinking during college years as a 'significant public health concern' (p719) and suggested that further

research focusing on coping and expectancies as well as individual differences is an important way forward.

In the present study the relative contribution of positive expectancies and coping to reported drinking and related behaviour was explored through the multiple regression models. The equation predicting drinking to cope revealed strong significant contributions from positive expectancies, age and from the interaction between gender and accommodation coping, though the main effect for gender was non-significant. The strong main effect for expectancies is similar to that reported by Cooper *et al.* (1988) as well as that found by Laurent *et al.* (1997) and is in line with the Social Learning Theory model. The finding that devaluation was the only coping factor to significantly predict alcohol use to cope would seem to conflict with findings from these two earlier studies. In particular, one would have expected to replicate the strong main effect for avoidance coping reported by Laurent *et al* (1997). However, the fact that devaluation coping overlaps considerably with avoidance coping in the present study (see Table 1) suggests that this difference across similar studies mainly reflects variation in methods of defining and measuring coping dimensions (a common problem in the coping literature, see Guppy *et al*, 2004) rather than any major discrepancy.

The significant gender x coping interaction has some links to findings from the previous studies though the similarities are not strong. In the current research, the relationship between accommodation coping and using alcohol to cope was found to be dependent on the gender of the participant. While this significant interaction is not directly comparable with the findings reported by Evans & Dunn (1995) nor those of Cooper *et al.* (1988), it is of interest to note the contingent nature of the association between drinking to cope and other forms of coping.

In predicting general alcohol consumption, age, gender, alcohol expectancies and drinking to cope were significant contributors to the equation. The finding that males were higher alcohol consumers than females is consistent with most of the literature and only really contrasts with studies such as Laurent *et al.* (1997) where the sample was unusual (i.e. very young). That expectancies contributed as a main effect emphasises the consistency across findings from Cooper *et al.* (1988), Evans & Dunn (1995) and Laurent *et al.* (1997). The strong contribution of using alcohol to cope to the prediction of consumption is clearly similar to that found by Cooper *et al.* and can be compared to the other coping strategy significantly predicting consumption (accommodation coping). The use of the cognitive coping strategy of accommodation was negatively related to consumption and contrasts with the non-significant contributions of cognitive coping shown by Evans & Dunn, though the beta weights in both studies were of

similar magnitude and direction. It is emphasised, however, that differences in the measurement of these coping strategies may account for the minor differences reported across previous research.

The final MRA predicting AUDIT scores again showed strong contributions from variables consistent with Social Learning Theory. Alcohol consumption, alcohol expectancies and drinking to cope were all significant main effects supporting Cooper *et al.* (1988) and Evans & Dunn (1995). The significant influence of age in this equation may be less important given the relative youth of the sample, yet emphasises the importance of controlling for such nuisance variables. The significant interaction indicating that avoidance coping was associated with higher AUDIT scores for females reflects the main effect findings of Evans & Dunn, and seems similar to the gender x avoidance coping interaction reported by Laurent *et al.* (though this in fact fell short of significance).

Taking the three MRAs together, it can be seen that alcohol expectancies strongly predicted drinking to cope and AUDIT scores but only weakly influenced overall alcohol consumption. Although Cooper *et al.* (1988) found much stronger links between expectations and drinking to cope than the other two outcome measures, the findings of Evans & Dunn (1995) seem more similar to the present study. This is particularly so given the lack of any significant expectancy x coping interactions in either study. The lack of significant contributions from the Mastery variable is somewhat surprising in the light of other research, though it is possible that control measures more specifically focused on the drinking context would have shown different results (Carver & Scheier, 1994).

With respect to coping, the significant main effects for devaluation and accommodation as well as the significant contributions of the gender-based interactions with accommodation and avoidance coping supports previous research emphasizing the role of general coping behaviours in predicting alcohol-related coping, consumption and disorders. However, there remains room for further research to clarify which kinds of coping are most influential and whether this influence is contingent on factors other than gender.

Thus, overall support is provided for the findings from the previous research and the Social Learning Theory model. As might be expected with slightly different measures, some differences have been demonstrated across the several related studies. There does seem to be a general consistency in the association between alcohol coping, consumption and the experience of problems related to alcohol use. The involvement of alcohol expectancies as well as indirect coping strategies in the various prediction models also seems generally consistent, but dependent on the measures used.

However, the majority of the research has adopted single-wave survey designs and thus severe limitations exist in the assumption of cause and effect relationships between the elements within these models. Increased use of repeated measures designs would allow greater confidence of the direction of causal relationships between expectancies, consumption, coping and problems. This has been identified as an issue within other fields of well-being and coping research (e.g. Zapf *et al.*, 1996) and it is clear that movement in this direction is necessary in order to develop the field (Schuckit, 1998). It is also clear that utilising methods and measures from the more general psychological well-being field could reap benefits rather than maintaining a distinction between general well-being and substance-specific research fields.

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# An historical account of epilepsy: Perceptions and treatment

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## Abstract

This paper gives a historical overview of how epilepsy was perceived throughout the ages, including its causes and the treatment rationale employed at the time. A brief review of some of the drugs and herbs that were commonly used in its treatment, and where possible, justification for their current use in light of recent scientific research is presented. The paper also looks at epilepsy in the developed world, and includes the studies on anti-epileptic drug development and the most recent strategies employed in the search for more effective treatment. In conclusion, the viability of using herbal medicine in the future treatment of epilepsy is discussed and the importance of introducing an integrated approach to the management of the condition stressed.

## Key Words

Epilepsy; seizure; antiepileptic drugs; herbs; sacred disease.

## Introduction

Epilepsy has been described in many ancient texts. An Acadian text of 2000 BC, which describes a person in a crisis, shows that even the Mesopotamians knew about the condition (Longrigg, 2000). The Yellow Emperor's Classic of Internal Medicine, also gives a vivid account of an epileptic attack consistent with a "grand mal" (Lai & Lai, 1991; Veith, 1973).

The term epilepsy, derived from the Greek "to seize or attack", denotes any disorder characterised by recurrent seizures of primary cerebral origin. A seizure may be defined as a clinical manifestation of a transient disturbance of cerebral function due to an abnormal paroxysmal neuronal discharge in the brain (Tierney, McPhee & Papadakis, 1999). During a seizure, large groups of neurones are repetitively activated and there is a failure of inhibitory synaptic contact between neurones.

The literature on the disorder is full of many historical descriptions. For example *perlesia*, which now means

paralysis, was used in ancient times (Elferink, 1999), as was the Greek description, the *sacred disease*, which arose from the belief that a god had entered the stricken one (O'Leary, 1976). The Romans called it *Morbus Comitalis*, a reference to the fact that an epileptic attack apparently spoiled the day of the comitia (the assembly of the people). In the Ayurvedic literature of Charaka Samhita (~400BC), epilepsy is described as "apasmara", which means "loss of consciousness". In late antiquity and early Middle Ages, the term "the falling sickness" was widely used, based on the tendency of the afflicted individual to drop to the ground suddenly and thrash about in convulsions. Another term, which was also commonly used, was "seleniazetai" because it was believed that the phases of the moon or the moon god (Selene) affected people with epilepsy, and from this arose the notion of "moonstruck" or "lunatic". People with epilepsy were therefore popularly called *Lunaticus*, (Temkin, 1971). Temkin (1971) wrote that the full moon made the brain "more liquid, the flesh more putrid and stirs up heaviness in the head of the epileptic". Despite the popularity of all these names, "the falling sickness" became the recognised traditional medical term.

Traditional remedies for the condition were handed down from the ancient Greeks and the practice whereby quacks continually proposed many strange "cures" were exchanged for equally preposterous ones. Out of ignorance, the sufferer became an object of pity and horror, a social outcast who fell prey to religious superstitions and was linked with witches and demons. As a result, the methods which ancient and medieval man used in treating epilepsy ranged from the rational to the magico-spiritual. Following the tradition of the ancient healers, treatment involved the use of diet, drugs, chemicals, metals, and plants. Other remedies and procedures such as observing the phase of the moon, the use of human blood and bones and amulets, which could be perceived today as superstitious, were also employed.

In the absence of well-trained physicians and the sophisticated medical science of today, the empirical treatment of epilepsy continued into the 19th century and failure at that time of supposedly reasonable remedies led physicians to the conclusion that epilepsy

was an untreatable condition.

Although, today the power of science and technology has provided us with a wider range of more effective and tolerable treatments for patients, a cure for epilepsy still remains elusive and the struggle to control seizures in many patients continues.

Epilepsy affects more than 50 million people worldwide ([who.int/mediacentre/factsheets/fs165/en/](http://who.int/mediacentre/factsheets/fs165/en/)). It is the most common serious neurological condition. Its prevalence is 0.5 % and some 1 in 5 people develop resistance to treatment (Sander & Shorvon, 1987). In the UK, the condition is said to occur in about 1:200 of the population (Sander, 2003; Sander & Shorvon, 1987).

## Attitudes towards epilepsy

In ancient Greece, it was believed that seizures were somehow sent by deities, hence the description “a sacred disease” (O’Leary, 1976). It was held that the state of seizure imparted some prophesying abilities to the victim—a belief, which found its way into medieval Europe. Hippocrates (400 BC), however, dismissed this notion, and was probably the first to note that epilepsy was a brain disorder with a possible genetic aetiology. He recommended physical treatments and stated that if the disease became chronic, it was incurable.

Galen attributed the cause of epilepsy to thick black bile or phlegm in the ventricles blocking the psychic pneuma, while convulsions were a biological reaction to the brain’s attempt to expel the blockage (Longrigg, 2000). He believed that all cases of epilepsy, which began at the time of adolescence, were caused by “dietetic errors”.

The Babylonian tablet, which is in the British Museum in London, gives another ancient and detailed account of epilepsy (Mehra, 1995). The tablet accurately records many of the different seizure types we recognize today. In contrast to the Ayurvedic medicine of Charaka Samhita, however, it emphasises the supernatural nature of epilepsy, with each seizure type associated with the name of a spirit or god. Treatment was, therefore, largely a spiritual matter. The Babylonian view was the prototype of the Greek concept of “the sacred disease”, as described in the famous treatise by Hippocrates (5th Century BC). In the Salem witchcraft trials, those afflicted with the condition were often regarded as contaminated by the devil and witches, (Kanner, 1930).

In both the Aztec and Inca cultures, a disturbed relationship with supernatural forces and a punishment for certain sins were seen as possible causes. It was believed that not only were those who committed sins susceptible to the condition, but that the presence of a dishonest person during childbirth could result in the newborn having epilepsy, (Elferink, 1999). The Incas regarded a person with epilepsy as someone who was

closer to supernatural forces than others and believed that “those who suffer from epilepsy are predestined for the offices of high priests”. For the Aztecs, slaves who were sold and then offered as sacrifices to their gods had to be free from diseases such as epilepsy to be considered worthy (Elferink, 1999). In fact, ancient Greek and Babylonian law allowed new slave owners to demand a refund or other compensation if it were discovered that a previously purchased slave had epilepsy!

From this it can be inferred that “the epileptic” was perceived as unclean and untouchable as it was even believed that whoever touched a sufferer would become prey to the demon. In 1971, Temkin, wrote that “the sight of a paroxysm is disagreeable, and its departure disgusting with spontaneous evacuation of urine and of the bowels”. The disorder was perceived to be contagious and so a person with epilepsy, who felt the emergence of an attack, would rush home or go to a deserted place where few people could see him.

The view that epilepsy was a brain disorder only began to take root between the 18th and 19th Centuries AD and the superstitious beliefs prevailed for over 2,000 years. In Europe, people with epilepsy made pilgrimages to places such as Rome and Terni (Italy), Ruffach in France, Poppel in Belgium, and Passau in Germany, where St Valentine, the patron saint of epilepsy was thought to have lived or visited, to seek relief (Temkin, 1971; WHO Media Centre, 2001).

All through this period, people with epilepsy were misunderstood, feared and viewed with suspicion and were therefore subjected to unnecessary social stigma. They were treated as outcasts and punished, although the likes of Julius Caesar, Pope Pius IX, Peter the Great of Russia, the writer Fedor Dostoevsky and the poet Lord Byron, St. Paul, Alexander the Great, Dante, Joan of Arc, Isaac Newton, Napoleon Bonaparte, Handel, Beethoven, Vincent Van Gogh, Alfred Nobel, Agatha Christie, and the actor Richard Burton, among others, became successful and famous regardless (Temkin, 1971; Nikanorova & Temin, 1997).

As we cross the ages into the 20th century, many countries still treated epileptic patients little better than the criminally insane. In Nazi Germany they were included on the list of people that were forcibly sterilized. Sadly, the United States was no better; in the 1920’s, there were laws in half of the states in the U.S. that authorised the sterilization of people with epilepsy, placing them together with “harmful groups of society” (Allen, 1986).

## Perceived causes of epilepsy

The cause of epilepsy was at one time thought to be associated with the size and shape of the head, possibly the effect of hypertrophy of the brain, or “too much

fluid". Patients who had an irregular shaped head faced an unfavourable prognosis. Iodine was used in such cases on account of its "great utility in case of thickening and effusions" (Ellitson, 1830).

As far back as 1826, Tucker reported that an irritation of calculi in the bladder was a causative factor. Also widely reported was the influence of sexual intercourse and during the Middle Ages, sexual excess was thought to trigger the condition in the most robust person, (Temkin, 1971) and so was masturbation. Retained semen was thought to be epileptogenic (Melville, 1982) and around this time the organ of ideality (cerebellum) was considered the seat of epilepsy. The belief was that onanism acted on the cerebellum to produce the disorder (Ellitson, 1830).

The cerebral hemispheres were seen as regions whose nervous influence was affected by increased secretions. Increased and deranged secretions of the brain had an indirect influence on the lower nervous system and its corresponding motor innervations. Deranged blood flow to the cerebrum was believed to result in loss of consciousness, (Annegers, Grabow, Groover, Laws, Elveback & Kurland, 1980), suggesting that disordered circulation was inseparably connected with nervous system afflictions such as epilepsy.

Some neurologists suggested that the cause of epilepsy was largely a nutritional one and patients who were properly nourished have less frequent manifestations of the paroxysms. The Eclectics observed the important influence of auto-intoxication on the cause of the condition (Ellingwood, 1909).

### **Current understanding of epilepsy**

The basis of our current understanding of the pathophysiology of epilepsy was established in the 19th Century with the work of the British neurologist, John Hughlings Jackson, who in 1863 proposed that seizures were caused by rapid transient electrochemical discharges in the brain (Jackson, 1863). Soon after, David Ferrier in London (Ferrier, 1873), Gustav Theodor Fritsch and Eduard Hitzig in Germany (Fritsch & Hitzig, 1870) discovered the electrical excitability of the brain in animals and man.

In the 1930s, the German psychiatrist Hans Berger developed the human electroencephalograph (EEG), (Berger, 1938), which revolutionised our current understanding of epilepsy. The EEG showed the presence of electrical discharges in the brain as well as the different patterns of discharges associated with different seizure types. In addition, the EEG helped to locate the site of seizure discharges and expanded the possibilities of neurosurgical treatments.

Another significant development that has enhanced the understanding and treatment of epilepsy in the last few

decades has been the introduction of neuroimaging equipment such as Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI). Such technology has helped to reveal many of the more subtle brain lesions responsible for epilepsy.

In most people with epilepsy, a cause is not identified and they are said to have "idiopathic" epilepsy. Some of the types of epilepsy that were previously regarded as "idiopathic" are now recognised as being of genetic origin. In cases when a cause (apart from the growing number of genetic factors) can be identified, the possible causes include the following: cerebral trauma, foetal anoxia, hypoxic damage to the hippocampus, tumours, vascular disease, degenerative disorders including Alzheimer disease, metabolic disorders and infectious diseases including both bacterial and viral meningitis/encephalitis, infections resulting from AIDS and brain abscesses (Annegers, Rocco & Hauser, 1996; Kumar & Clark, 1998).

### **Historical treatments**

Whether based on logic or superstition, treatments remained mysterious, bizarre and often dangerous. Some physicians looked upon the eradication of the disease as "beyond the power of our art" (Todd, 1853), while others proposed a great variety of different 'wondrous cures' (Temkin, 1971). Such was the terror in which the condition was held that the mere praise of an influential physician for a particular remedy often resulted in its undeserved popularity.

### **Treatments based on religion/superstition**

In keeping with its description as the "falling evil", men in the Ages of Faith turned to the intercession of the saints and prayed especially to Saints Cornelius, Valentine and John, patron saints of epilepsy. In Flanders the belief existed that God punished St John with epilepsy because he asked God to show him thunder! This probably explains why St John's Wort was worn as an amulet (Spinella, 2001). Pilgrimages were made to the priory of St. Valentine where at the end of the 15th century a hospital for people with epilepsy was built (Temkin, 1971), and they handled relics associated with saints, which were named after the condition and believed them to be effective in warding off attacks.

Believing that sin was the main causative factor, the Aztecs and the Incas thought they could treat epilepsy effectively by cleansing the body with water (Elferink, 1999) as it is done in Christianity, where the sacrament of baptism is symbolic of the removal of original sin. Indeed, water as a sign of cleansing and purification had spiritual connotations in all cultures. The Aztecs also believed that staying indoors on the days the goddesses were supposed to roam the air, as advised by the gods (Elferink, 1999) was an effective method of prevention.

The use of blood in various modifications remained one of the main magical and superstitious remedies. The mouth of a person with epilepsy, who had collapsed was either smeared with blood, or in most cases the patient was made to drink human blood. Pliny, in his writing, showed his distaste of the practice where sufferers were made to drink blood of gladiators, (Temkin 1971). Although considered an effective treatment strategy at the time, the revulsion in which it was held as illustrated by Pliny's account further demonstrated the low social status with which people with the condition were associated.

In situations where the cause was attributed to increased blood flow, local bloodletting, purgatives and blisters were considered panaceas. Bleeding was thought to be appropriate if a structural disposition existed as this would serve to lessen its excitability. Patients were bled from the arm and then given emetics as well as the application of leeches to extract even more blood. Bloodletting applied locally was thought to prevent permanent structural changes occurring (Jackson, 1931). In 1853, Todd wrote that blisters were applied to the nape of the neck in some cases. The practice of using leeches for bloodletting as treatment of epilepsy and a wide variety of other brain disorders became so popular that in France for instance, leeches became an endangered species and had to be imported to replenish dwindling stocks (Marderosian, 1999; Graff, 2003).

Of the use of animals in treatment, Pliny praised donkey's milk, while Dioscorides favoured their burned hooves (Kanner, 1930).

The pathophysiology of the disease was poorly understood then and the treatment generally reflected this. Treatment of patients was rarely confined to any one thing; more often a combination was tried, possibly until a seemingly favourable result was achieved or more likely the patient died from poisoning or severe blood loss. It is difficult to understand the logic of some of the treatments. Perhaps none existed and that healers simply believed that drastic and mysterious diseases were more likely to respond to drastic measures.

## **Chemicals used for treatment**

Most of the chemicals used were based on the theory of removing excitatory causes rather than sedating the nervous system. As the excitatory causes were thought to arise from the stomach or the sexual organs, remedies used included emetics, purgatives or intestinal stimulants. Silver nitrate was commonly used before the introduction of potassium iodide, whilst croton oil was used at Guy's Hospital to produce copious evacuation (Todd, 1853). It has been shown that in some people whose seizures begin with an aura, breathing the vapour of aromatic oils at the start of the warning can reduce the possibility or severity of the attack, (Betts, 1992). The

relaxing essential oils such as lavender and chamomile appear to exert their therapeutic benefit by acting on the limbic system.

At Kings College Hospital, chloroform was given for convulsive rigidity to render the patient insensible "without excitement" (Ellis, 1813). Mercury was considered very powerful in "equalling the circulation". The alkaloid strychnine was used around 1850 to increase excitation thus making it more difficult for an existing cause to induce a fit; suppression of symptoms at any cost seemed to be the strategy of the day.

On May 11<sup>th</sup> 1857, Sir Charles Locock reported to the Royal Medical Society of London the successful treatment of epilepsy with bromide (previously used for its anaphrodisiac qualities) - the first treatment employed to sedate the nervous system. Following that report, the use of bromides for epilepsy became widespread and by the mid-1870s, two and a half tons a year were used at the National Hospital London alone, (O'Leary & Golding, 1976). Bromide at that time was seen as the 'wonder drug'. However, it soon became evident that it had a number of adverse effects, seriously limiting its use. Some physicians, well aware of its side effects, spoke out against its use (Fox, 1920). Because of the stigma of epilepsy, the risk of adverse effects may have been considered to be more acceptable than the disorder itself (Temkin, 1971).

Although bromide is considered to be an out-of-date drug by most clinicians, it is interesting to note that some specialist centres still use it for patients whose seizures are resistant to other reasonable options. The modern era of drug treatment began with the development of phenobarbitone and phenytoin. However, these drugs also have adverse effects that might be considered unacceptable by many people taking them. Phenobarbitone, because of its low cost, is often the only option for most people in developing countries and not even this option is available to many of them. There is still a very large "treatment gap" between the number of people who have epilepsy in developing countries and the number who have access to antiepileptic medication. Phenobarbitone and phenytoin were followed by a group of antiepileptic drugs that might be referred to as "the well-established drugs". These include carbamazepine and sodium valproate that are still widely used in Europe and the United States. The endeavours to achieve better control of seizures with less adverse effects have led to the development of a large number of newer antiepileptic drugs that have become available within the last fifteen years in the USA, the UK and a number of other countries. These newer drugs include vigabatrin, lamotrigine, felbamate, gabapentin, tiagabine, oxcarbazepine, levetiracetam, zonisamide and pregabalin (Scott, 1992; Kasteleijn-Nolst TrenitÄ & Edelbroek, 1997). However, some of these newer drugs were found to have serious adverse effects. Vigabatrin may cause concentric visual

field defects in around 25% of those who take the drug for a long period (Eke, Talbot & Lawden, 1997). Felbamate has been associated with bone marrow suppression and fatal liver damage (Palmer & McTavish, 1993; Dichter & Brodie, 1996). There are continuing efforts to find antiepileptic drugs that are more effective and also more acceptable in terms of reduced adverse effects.

### **“Surgical” interventions**

Of surgical measures, cauterisation took the first place; a hot iron was usually applied to several places on the head or body. It was also used as a prophylactic treatment and performed by laymen without the aid of surgeons. Peasant women handed their children to their priests to perform the procedure. Medieval physicians justified cauterisation and claimed that hot irons counteracted deficiency of warmth and superfluidity of humors, (Temkin, 1971).

Skulls have been found in early Neolithic burial sites in France and Peru with evidence of holes perhaps bored before death (Rogers, 1930). There are many references to the use of trephining in epilepsy treatment although it was reportedly used only in the most stubborn of cases (Binkley, 1892). The indication usually rested on the suspicion of mechanical irritation or compression of the brain. It is doubtful whether such treatments were helpful, as inexperienced physicians using crude equipments would have performed the procedure.

The idea of removing the causative factor was quite forward thinking in light of today’s knowledge. Resective surgery is performed in many countries today and a good surgical outcome can be expected in correctly-selected cases, particularly those that are suitable for temporal lobe resection (Otsuki & Yoshimoto, 2000). Surgery on children with medically intractable lesional epilepsy is successful in 50-90% of cases (Danielsson, 2000) and up to 50% of children become seizure free in the absence of lesions (Dunoyer, 2000). It must however, be stressed that neurologists today have the advantages of professional training and neuro-imaging techniques, which were not available to our ancestors.

Physicians justified tracheotomy as a treatment option where the symptoms were due to spasmodic closure of the laryngeal opening; fits were said to be reduced by 75% in severity and by 50% in numbers (Bucknell, 1853).

Other novel surgical procedures including obliteration of the arteries not only reduced congestion but also produced atrophy. This method was supposed to render seizure attacks impossible (Pereire, 1849), although considering the possible side effects, this procedure could hardly be deemed effective. Surgical procedures such as severing nerves, cliterectomy and amputations were all performed to reduce excitatory induced seizures. Castration and oophorectomies were recorded as late as

1880 as a therapeutic measure, (Lawson, 1880). In order to reduce excitation, some advised eunichism to prevent transmission of the disease to offspring (Kanner, 1930).

### **Nutrition and lifestyle**

Some physicians even then had an holistic view of the treatment of epilepsy and admitted having tried various medications, none of which was decidedly beneficial, and recognised the benefit of diet and lifestyle factors, (Prasad, Stafstrom, & Holmes, 1996). Aurelius Cornelius Celsus, a contemporary of Jesus offered good advice in 25 AD some of which would even be appropriate today. He asked patients to avoid the sun, fire, and all things hot as well as cold wine, the sight of steep places, vomiting, and stress generally (Melville, 1982).

Interestingly, epileptic colonies were set up in America at great financial cost primarily to provide “a safe tranquil environment with the best staff available” to care for children with epilepsy. In 1857, a hospital for the "paralyzed and epileptic" was established in London and at the same time epilepsy ‘colonies’ were set up in places like Denmark, Germany, Holland, Norway and Switzerland to deal with the social problems of epilepsy; i.e. care and employment. Some heavily criticised these institutions while others hailed their therapeutic benefits. Physicians who took an interest in the colonies were often amazed by the mutual support of the “patients”. According to those who followed the work of the Craig colonies (1904-1915), there was a reduction in average dose of bromide from 20.5 grams to 0.6 grams and during the same period the incidence of seizures was greatly reduced (Shanahan, 1920).

In Britain today, there are three residential schools, which cater for children with epilepsy and associated disorders. These centres provide round the clock educational and medical care in an environment not dissimilar to what is described in the colonies. These centres are both popular and very successful, perhaps a direct result of the holistic care that is provided.

### **Herbal treatments**

The use of medicinal plants was also very popular in ancient times. A Renaissance-period cure, which dates back to Galen, consisted of a mix of mistletoe, peony roots and seeds gathered during the waning moon, and a man’s powdered skull (Kanner, 1930). Among the herbs, which were routinely used, were mistletoe, peony, digitalis, lobelia, valerian, belladonna and cannabis. Most of these herbs have enjoyed a long traditional use in the treatment of nervous system disorders and it is remarkable that even today practising herbalists still employ some of them as part of their treatment regimen.

No other plant has through the ages enjoyed as great a reputation as the mistletoe. The Druids held it in great

esteem and much ceremony and religious rites attended its gathering. Plucked on the sixth day of the new moon it was said to have magical virtues and was considered a cure all. Mistletoe, rooted in the branches of the oak tree, could not fall and was therefore in the logic of the time applicable to the “falling sickness”. Its growth on oak trees is rare and may explain why mistletoe of oak was most frequently prescribed (O’Leary & Golding, 1976). The Eclectics used mistletoe in combination with other herbs and was reputed to subdue epilepsy and tone the nervous system as well.

Peony, derived from the name of the divine physician of the Greek gods, *Paen*, was almost as popular as the mistletoe. Its use appears to be based on superstition rather than science. However, Galen recommended it to be worn around the neck and explained that when worn some particles were drawn in by the patients breath (Kanner, 1930). For use in epilepsy, peonies were to be gathered during the wane of the moon since epileptic attacks were presumed to occur more often as the moon wanes (O’Leary & Golding, 1976). Among the Etruscans the root of peony was worn in an amulet to keep away “incubi”. A study by Goto, Shimada, Tanaka, Tanigawa, Itoh & Terasawa (1999), demonstrated that gallotannin, an active constituent of peony root, showed an endothelium-dependant vasodilatory effect on isolated rat aorta. This action would explain why the root of peony is used today in Asia and Europe to increase circulation and why it was used historically in the treatment of epilepsy.

The effects of digitalis as an emetic and purgative were well recognised (Culpepper, 1826). Purgatives were indicated for this condition to expel excess phlegm or poisons from the body. Digitalis was seen as amphoteric, i.e. balancing the circulation by increasing or decreasing it as appropriate; it was also used as an alternative to blood letting. Above all, it was considered ‘antiphlogistic’ by its diuretic action, with such properties as removing excess fluid and poison from the brain. On the other hand, because blood deficiency and reduced cerebral blood flow were also thought to cause epilepsy or a seizure, in these circumstances digitalis was usually the herb of choice (Aronson, 1985). Today, Digitalis is known to be an effective cardiotonic.

In spite of the reported benefits, Valerian, which was presumably widely available at the time, was not commonly used. A General, who developed the condition in 1814 began treatment in 1829 with 1/2 grain of hydrocyanate of iron with 1 grain of Valerian made into a pill. He took 16 pills a day and was cured of seizures in three months, remaining seizure free for 24 years until death (Todd, 1853). The Italian botanist Fabius Columba claimed that Valerian cured him of epilepsy (Hobbs, 1993). Its unpopularity was probably due to its unpleasant smell, which would have been repulsive to sufferers, who often report of feelings of nausea and

heightened sensitivity of their senses prior to onset of seizures. Dioscorides knew the plant as “*phu*”, the sound of the word reflecting its unpleasant smell (Chevallier, 1996).

## Other herbs used

Around the world locally grown herbal remedies were tried, tested and used and one would assume their choice was based on trial and error, intuition and availability. Among such herbs included Lily of the Valley (Culpeper, 1826; Kanner, 1930) and magnolia. Herbs like *Magnolia grandiflora* were used in traditional Mexican medicine, and it is now known that this plant has central nervous system and cardioactive properties. Clove oil is indigenous to the Molucca islands and in Iranian folk medicine the buds of the plant were used to treat epilepsy (Pourgholami, Kamalinejad, Javadi, Majzoub & Sayyah, 2000). The Eclectics used other herbs such as Avena, Passiflora and Caulophyllum, (Ellingwood, 1914).

The use of herbs such as Avena, Passiflora and Valerian all of which have sedating properties is interesting in the light of current research. For instance, it is known that stress is both a major precipitating and exacerbating factor in the frequency of seizures. A retrospective study carried out on 250,000 inhabitants in the Netherlands to investigate the influence of forced evacuation on the seizures of patients with epilepsy showed a positive correlation between a stressful life event and seizure frequency (Swinkels, 1998; Puskarich, 1992). While investigating the effect of progressive muscle relaxation techniques on seizure frequency, the researchers concluded that such techniques should be incorporated into clinical practice. It is also known that temporal lobe epilepsy (TLE) is refractory to medical therapy and one in five people with TLE present with anxiety and depression (Scull, 1997).

While the majority of herbs used historically in treatment acted primarily on the nervous system, the use of foxglove and lily of the valley (both cardiotonics) remain mysterious. New and exciting evidence, which perhaps validates their traditional use, emerged as recently as the year 2000. Zaidi, Clough, Cooper, Scheepers & Fitzpatrick (2000) reported in a study that 20-30% of patients diagnosed with medically intractable epilepsy were originally misdiagnosed and found to be suffering from a cardiovascular complaint instead. Cardiovascular syncope (with cerebral anoxia and abnormal movements) and epilepsy are very difficult to differentiate clinically, and as such would have been viewed as the same disease in the past!

## Current treatment of epilepsy

The major aim of treatment is seizure control, and this is crucially important for, besides preventing injury inflicted by falling, it has been shown that single and

intermittent brief seizures as well as prolonged seizures can induce apoptotic cell death (Pelletier, Wadia, Mills & Carlen, 1999; Bengzon, Kokaia, Elmér, Nanobashvili, Kokaia & Lindvall, 1997). Increased frequency and intensity of seizures also lead to more architectural changes in the brain that may exacerbate the condition (Carvey, 1998).

Currently, the only effective means of treating epilepsy is orthodox medication and in a small proportion of people in whom medication is not effective surgery is a possible option (Engel, 1996). Surgical intervention often involves removing some portion of the brain where the seizures start. To minimize the impact of loss, functional examination of the brain is performed during surgery. These surgeries have led to more precise understanding of the location of the various sensory and motor functions in the cerebral cortex.

## Conclusion

Many neurologists today would agree with Temkin in *The Falling Sickness*, when he says: “the history of epilepsy epitomises the long struggle between magical and scientific concepts of disease..”. Clinicians view this period optimistically and would argue that never before have there been so many new AEDs available for the management of epilepsy. Progress has been made, but there is still a great need for more effective antiepileptic drugs that have less adverse effects. Treatment remains complex and challenging to clinicians even with the wide range of AEDs available, and in many cases the efficacy of the drugs is unsatisfactory. Despite the developments of antiepileptic drugs, some people with epilepsy continue to have seizures that are resistant to treatment. However, with the continuing development of new antiepileptic drugs, there is growing optimism that the future will be better for such patients. In addition, neurosurgical techniques are continually improving and are guided by neuroimaging of the brain that has undergone remarkable advances over recent years.

Although a large amount of money has been invested in training neurologists, developing technology and producing AEDs, there are many people throughout the world who do not have access to basic care, particularly in the developing countries, and the majority of people in these countries do not have access to AEDs. Even in more prosperous countries such as the USA and the countries of the European Community, services remain patchy with high-quality specialist services available to a relatively small proportion of the total population of people with epilepsy. Epilepsy research is currently under-funded in comparison with other neurological conditions. Although it is encouraging to note the emergence of several new antiepileptic drugs in recent years, the high cost of developing and marketing these drugs may limit future prospects for epilepsy treatment.

For some patients, the seizures remain uncontrolled despite the new drugs that are currently available.

Given these problems, it would seem logical to explore other sources such as the plant world for suitable treatments. While eagerly awaiting further research, phytomedicines which have been shown to contain pharmacologically active constituents, with relatively limited side effects, could be potentially useful adjuncts to orthodox drug therapy and should be considered as part of a medically monitored treatment plan in the management of epilepsy. However, the efficacy of herbal medicines remains a matter of concern. The quality and quantity of the constituents present in any herbal product ultimately contribute to its effectiveness and some people even argue that constituents vary within plants depending on whether they are wild-crafted, cultivated, grown in different parts of the world, and harvested at different times. Manufacturers up to now have found the route from plant to safe reliable pill difficult and unpredictable compared with orthodox drugs. Thus, there is limited incentive to base drug development on plants. Despite all these concerns, there is enough evidence that certain plants can serve as potential sources of reliable pharmaceuticals for treating epilepsy and perhaps conducting proper trials on herbal remedies that are thought to have been well established and have already been used in many human patients would be a step in the right direction.

Medical knowledge has built on a combination of research and experience. There is a case for drawing on the wealth of knowledge and experience that has already been gained from herbal and traditional treatments. Further advances would benefit from commitment from both conventional and traditional practitioners. In the past orthodox medical practitioners and those using traditional treatment such as herbal medicine have tended to work in isolation from each other. Taking the very best from scientific endeavour and from natural remedies might be a more fruitful approach, leading to even greater benefits for the patient.

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# Developing a framework for critiquing health research

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## Abstract

A new framework for critiquing health-related research is presented in this article. More commonly used existing frameworks tend to have been formulated within the quantitative research paradigm. While frameworks for critiquing qualitative research exist, they are often complex and more suited to the needs of students engaged in advanced levels of study. The framework presented in this article addresses both quantitative and qualitative research within one list of questions. It is argued that this assists the 'novice' student of nursing and health-related research with learning about the two approaches to research by giving consideration to aspects of the research process that are common to both approaches and also that differ between quantitative and qualitative research.

## Key words

Research critique; critique framework; health research.

## Introduction

When undertaking an undergraduate programme in health related studies, as in many other academic disciplines, students are required to demonstrate the ability to read, understand and critique research reports.

Health research was at one time guided by the 'medical model'. However, though this model remains influential, Polgar & Thomas (2000) suggest that there have been changes in the role and status of other health professionals that have brought different perspectives, and require different approaches to research. A more holistic approach now influences how health care is conceptualized, and how research is conducted. The methodology of social research has become an accepted part of health research.

Green and Thorogood (2004) state that "*health research includes any study addressing understandings of human health, health behaviour or health services, whatever the disciplinary starting point*" (p5). They further suggest that health research may expand

knowledge of society and health, or address an existing health care problem. Undergraduates of health related studies therefore have to consider health research in its broadest sense.

A common method of assessing understanding both of the subject area and the research methodologies utilized within that subject area is the presentation of a detailed critique of a piece of published research. Our experience in teaching students across a range of programmes in Nursing, Health Sciences/Studies, Health Promotion and Health Policy programmes has taught us how difficult many of our students find this task. With the help of funding from the Learning Development Unit we undertook a project to develop, implement and evaluate a research critique framework that students could use as a guide.

This article analyses the content of frameworks that are commonly used to critique quantitative research and frameworks that are commonly used to critique qualitative research and then presents a single framework that addresses both research approaches. This new framework is currently being used to assist teaching and learning activities relating to the critical appraisal of published research. As such, it is still in the developmental stage and as teachers we continue to reflect on the application of this framework to our teaching. Feedback from students is essential to this development and the article presents evaluations from students who have been involved in learning activities during the early developmental stage of the framework. This evaluation is continuing and we would also welcome comments from our colleagues.

## The need for a research critique framework

The need for able and competent health care practitioners is self-evident. One way of ensuring competence is through evidence based practice and health professionals are expected to be intelligent consumers of research, and this entails the ability to read, understand and apply published research (Murdaugh *et al*, 1981). A change of culture arose

following the move of colleges of nursing into the further and higher education sector, resulting in an educational culture where critical enquiry and evidence-based practice is accorded greater priority (Benton, 1999). Most students are introduced to research methods and critical appraisal during their undergraduate education, or preparation for professional practice. Yet McCaughan *et al* (2002) report that qualified nurses reported problems in interpreting and using research. MacAuley *et al* (1998) highlighted how GPs who had been introduced to a model of critical reading were shown to have applied a more appropriate appraisal to studies than those who relied on critical appraisal skills acquired previously. Whilst literature in relation to the ability to critically appraise research is abundant in relation to nursing and to a lesser degree in medicine, there is an emerging body of evidence in relation to other health care professionals. Chalen *et al* (1996) identified several barriers to research-mindedness in radiographers, including a lack of knowledge of research methodologies. Domholdt *et al* (1994) noted that this group had particular difficulty in identifying concerns with construct validity.

Work in the field of health and health care is multi-disciplinary and involves a variety of approaches to research. Further the range of such research is wide, from concerns with the relationship between the health needs of a population to aspects of the provision of health services (Bowling, 2002). Government policy and professional guidance insist that professional practice should be based on evidence (Gomm & Davies, 2000). While Pearson & Craig (2002) elaborate on the need for nursing practice to be evidence-based, the need for evidence-based health promotion has been highlighted by Perkins, Simnett & Wright (1999), who also point out that the achievement of the targets of 'Our Healthier Nation' depend on the commissioning and implementation of effective health promotion programmes.

Given the primacy placed on the use of evidence in the field of health and health care, it is important that students are enabled to critique published research in order to determine the usefulness of that research in their chosen field of work. By 'critique' we mean the ability to critically appraise published research by identifying the strengths and weaknesses of the research and forming judgements concerning its overall quality and applicability.

Research in the fields of nursing, health studies, health promotion and health policy can be of a quantitative or qualitative nature: both research approaches provide valuable information for the disciplines and often complement each other. As such, students are required to read and critically review quantitative and qualitative studies. However, many of the available frameworks for conducting a critical review are written within the quantitative paradigm (e.g. Benton & Cormack, 2000; Polgar & Thomas, 2000). There has been a tendency to evaluate qualitative research against criteria appropriate

to quantitative research (Sandelowski, 1986). This can result in students attempting to analyse qualitative research within a quantitative framework and thus can lead to unjustified criticism, for example, quantitative frameworks for critique will direct students to raise questions concerning reliability and validity, rather than confirmability, dependability, credibility and transferability. These activities, which may lead to students appropriating the language of quantitative research when critiquing qualitative research, can only serve to perpetuate the view of qualitative research as a 'soft science' and detract from its value as a research approach in its own right that aims to acquire information that is different from that acquired by quantitative research (Leininger, 1994).

There has been considerable debate concerning whether quantitative and qualitative research can be assessed using the same criteria (Mays & Pope, 2000). While there are many criteria that will be common to both research approaches such as the identification of an appropriate question, the choice of an appropriate research design, the conduct of a thorough and relevant literature review, there are also discrete areas of difference. For example, variables are not always given operational definitions in qualitative research as sometimes the aim of the research is to seek definitions of the concepts from the viewpoint of the informants.

Various frameworks were reviewed and the common features that relate to quantitative and qualitative research were identified. In general guidelines tend to reflect the philosophies of the respective approaches in that guidelines for quantitative research tend to be in the form of checklists, whereas guidelines for qualitative research tend to be more discursive.

## Frameworks for critiquing quantitative research

The framework presented by Sajiwandani (1996) provides a useful checklist covering points that are appropriate for critiquing quantitative research relevant to nursing and health care students and provides an explanation and rationale for critique. Polgar & Thomas (2000) also provide guidelines specific to the critical evaluation of quantitative research papers. Benton & Cormack (2000) offer criteria for critical evaluation of research but do not state that their criteria are intended for use with a particular research approach, however, the criteria are written within the quantitative framework in so far as they refer to hypothesis, operational definitions, validity and reliability of any instruments or questionnaires. Treece & Treece's (1986) classic text offers a comprehensive list of questions to aid critical evaluation, but again it is written within the quantitative paradigm.

The website of cybernurse ([http://www.cybernurse.org.uk/research/Reading\\_and\\_Critiquing\\_Research.htm](http://www.cybernurse.org.uk/research/Reading_and_Critiquing_Research.htm)) offers a framework for the

areas that should be considered when critiquing a research report. There is no indication regarding which research approach this framework can be used for, but in terms of data analysis only statistical analysis is mentioned, yet hypotheses are not mentioned. In addition, there are many important omissions, for example, research design, recommendations, limitations.

While considering a range of frameworks focusing on quantitative research the areas that appeared most consistently were in relation to the research design; hypothesis, operational definitions, population and sampling, sampling methods, validity and reliability of data collection, data analysis and generalizability. However, there were a plethora of critique frameworks that focused on very specific designs, rather than on generic quantitative research, and these of necessity had far more detailed guidelines for critique. The website of the University of Wales ([www.uwcm.ac.uk/library/critical\\_appraisal/forms](http://www.uwcm.ac.uk/library/critical_appraisal/forms)) offers different frameworks for appraising systematic reviews; randomised control trials; trials without randomisation; cohort (longitudinal) studies; case-control studies and cross-sectional studies. This in itself pre-supposes a level of research design awareness that is likely not to be evident in undergraduate students during the early stages of their programmes of study.

While there appears to be some degree of consensus concerning the areas that should be addressed when critiquing quantitative research the situation is less clear when it comes to qualitative research.

### **Frameworks for critiquing qualitative research**

Hammersley (1992), writing specifically concerning ethnography, provides criteria for assessing ethnographic studies. Questions are raised concerning the extent to which new theory is produced, how far is the theory developed and how novel are the claims made. He also refers to the credibility and transferability of the findings, as well as the influence of the researcher on the findings. Mays & Pope (2000) refer to the increase in interest in assessing the quality of qualitative research and, drawing on the earlier work of Hammersley (1992), identify two broad criteria: validity and relevance. These authors acknowledge that these concepts can also be used when assessing the quality of quantitative research, but when used in relation to qualitative research they need to be operationalized differently to reflect the distinctive goals of qualitative research.

The website of the Public Health Resource Unit (<http://www.phru.nhs.uk/~casp/qualitat.htm>) presents a framework for critically appraising qualitative research built around ten questions, with supporting detailed guidelines. Areas that are specific to qualitative research

include the relationship between the researcher and the participants and rigour in relation to data analysis. Greenhalgh & Taylor (1997) provide an overview of the nature of qualitative research and again suggest a framework for critique based on nine questions with supporting guidance. In terms of being specific to qualitative research, the authors refer to the need to acknowledge the researcher's perspective, a detailed description of methods used for data collection, quality control measures in data analysis and the credibility of the results and the transferability of the findings to other settings. Forchuk & Roberts (1993) claim that there is a paucity of guidelines for examining qualitative work and provide a framework for this purpose, which is aimed at undergraduate nurses and other health professionals. The authors cover Leininger's (1990) criteria for rigour, but with minimal explanation. Overall the guidelines are relevant and useful for qualitative studies, but the journal may not be readily accessible to all health studies students.

Highly specialized texts exist that offer advice, discussion and debate, concerning the evaluation of qualitative research (Leininger, 1994; Morse & Field, 1996; Kuzel & Engel, 2001), and, *inter alia*, refer to issues like the context of the research and the need for an audit trail.

### **Frameworks for critiquing both quantitative and qualitative research**

Gomm, Needham & Bullman (2000) provide questions to be asked concerning quantitative research, in terms of three sections: Questions to ask about data collection instruments; questions to ask about experiments; questions to ask about surveys, case finding (or 'clinical epidemiological') studies and case control studies. They also provide questions to ask about qualitative research in which attention is drawn to the setting of the research, the researcher's role in the research and the relationship of the study to other research in the field.

Stevens, Schade, Chalk & Slevin (1993) provide a chapter on evaluating research in a book aimed at health care professionals. This is perhaps one of the most misleading guides in terms of evaluating qualitative research. A framework for research evaluation is provided and at the beginning it is acknowledged that qualitative research is not necessarily performed and presented in the same format as quantitative research. It is further stated that, in the light of this, reference will also be made to qualitative research. Though reference is made to qualitative studies, it is inadequate and sometimes misleading, for example, in the methods section reference is made to validity and reliability in measuring instruments, but qualitative methods are ignored. Further, in the results section qualitative findings are not mentioned.

Nieswiadomy's (1998) guidelines for critique appear to follow the quantitative paradigm, however, she does stress that not all studies require a hypothesis and that "*studies of a purely descriptive nature*" (p342) may not contain hypotheses, in which case research questions may be used. Also, under the section headed 'Research Design', Nieswiadomy states that quantitative designs and qualitative designs are evaluated using different criteria. However, limited advice is offered to guide qualitative critique. Valente (2003) provides a framework that mentions quantitative and qualitative research in some sections, for example, method, but refers solely to quantitative in others, for example, analysis. Overall, the framework is heavily biased towards quantitative research, and when both approaches are discussed it is not clear which approach is being addressed.

The website of the University of Wales College of Medicine ([www.uwcm.ac.uk/library/critical\\_appraisal/forms](http://www.uwcm.ac.uk/library/critical_appraisal/forms)) provides a series of guides on critical appraisal of research studies, all taking the format of a table that identifies a question and directs the reader to answer by ticking 'yes', 'no' or 'can't tell', but with no guidance as to what should be considered when answering the question. The questions are focused towards critically appraising the research for the purpose of ascertaining its relevance to practice, and assumes a high level of knowledge of research methods in order to be able to answer the questions, so would be difficult for undergraduates to use effectively.

Parahoo (1997) takes account of both quantitative and qualitative approaches to research and provides a list of broad headings that encompass both approaches. The guidelines are comprehensive in terms of quantitative research, but less so for qualitative research. Each point for critique initially addresses quantitative strategies and is followed by a paragraph suggesting a different approach for qualitative work. For example, Parahoo states "*in qualitative studies, researchers may not want to be influenced by previous research. They should, however, give a rationale and make reference to the relevant literature*" (p363). However, qualitative research is addressed with less rigour than quantitative research and the less discerning student may well confuse the two approaches. The guidelines fail to clearly set out the different criteria for each strategy, for example reliability and validity are discussed, but confirmability, dependability, credibility and transferability are not referred to. However, attention is also drawn to the need for rigour and an audit trail.

In a book written for nurses, LoBiondo-Wood & Haber (1994) provide two separate chapters for quantitative and qualitative critique. Dealing with the two strategies in different chapters could be difficult for the novice student who is still trying to internalize the difference between the two approaches. However, both are dealt

with thoroughly and do provide useful guidelines for the more advanced students. They make useful cross-references to other chapters in the book. Hek (1996) highlights the importance of critical evaluation as a means by which nurses can practice knowledgeably, and stresses the importance of developing critical evaluation skills, recommending a six-stage process. Quantitative and qualitative research are both addressed within a specific guide to the sections of the research that should be considered, but the complex integration of quantitative and qualitative critique might be confusing to the novice student. Some essential components, such as setting, population and sample are omitted. Further, the guide is presented in textual format and so some detail can be lost.

Burns & Grove (2001) offer frameworks for both quantitative and qualitative research in nursing, acknowledging the need for differing approaches to the critique of different types of studies. While their framework for quantitative research includes the standard topics like research objectives, questions or hypotheses, the definition of variables, the identification of independent and dependent variables, validity of instruments, statistical procedures, when it comes to qualitative research, other questions are raised. Burns and Grove thus refer to 'descriptive vividness', looking for clarity and factual accuracy of the researcher's account of the study. The context must be clear as data are context-specific. Rigour in qualitative research demands a clear account of the study elements, e.g. the philosophy, the role of the researcher, the process. Auditability and a decision trail are also required and any theory derived from the study must reflect the data. DePoy & Gitlin (1998) provide 'guiding questions' to critically evaluate quantitative and qualitative research studies. They present two adjacent lists, headed 'experimental-type' and 'naturalistic inquiry', each with very similar questions except for the entry for quantitative research concerning validity and reliability, where its qualitative counterpart refers to trustworthiness.

Polit & Hungler (1999) offer separate guidelines for quantitative research and for qualitative research. These are thorough and complex and are presented in sections, for example, guidelines for critiquing research problems, research questions and hypotheses; guidelines for critiquing research literature reviews, and so on. The guidelines for quantitative research vary little from those already reviewed. The guidelines for qualitative research include reference to the research tradition within which the study is carried out and highlight that the research question and methodology should be consistent with the research tradition. Again, an accurate description of the research design is required, as is trustworthiness of the data. Credibility, transferability, dependability and confirmability are included in the guidelines. In terms of data analysis, Polit and Hungler state that the themes

should represent the narratives and there should be evidence of accuracy of the researcher's analysis and that the context of the research should be clear. Polit and Hungler's framework for critiquing research is also available on a web-site (<http://www.sonoma.edu/users/n/nolan/n400/critique.htm>). This is a comprehensive framework, but complex and not easily accessible for novices.

### Development of a new framework

Having reviewed a range of published research critique frameworks, the first step was to identify the common

features (Table 1). Following this the strengths of individual research critique frameworks were identified. This enabled us to develop a framework that had areas that were common to both quantitative and qualitative approaches, and areas that were specific to each (Figure 1). To support the diagrammatic framework guidelines are available and provide the teacher and the student with an extended explanation of each item. Examples of these guidelines are as follows:

Item in Research Critique	Guideline
<u>Framework</u>	
Is the literature review comprehensive and up-to-date?	The literature review should reflect the current state of knowledge relevant to the study and identify any gaps for conflicts. It should include key or classic studies on the topic as well as up to date literature. There should be a balance between primary and secondary sources.
<i>Quantitative:</i>	
Is the sample adequately described and reflective of population?	Both the method of sampling and the size of the sample should be stated so that the reader can judge whether the sample is representative of the population and sufficiently large to eliminate bias.
<i>Qualitative:</i>	
Is the selection of participants described and the sampling method identified?	Informants are selected for their relevant knowledge or experience. Representativeness is not a criteria and purposive sampling is often used. Sample size may be determined through saturation.
Is the conclusion comprehensive?	Conclusions must be supported by the findings. The researcher should identify any limitations to the study. There may also be recommendations for further research or, if appropriate, implications for practice in the relevant field.

**Table 1:** Common features of research critique frameworks

Quantitative	Qualitative
Research design	Philosophical background
Experimental hypothesis	Research design
Operational definitions	Concepts
Population	Context
Sample	Sample
Sampling	Sampling
Validity/reliability of data collection	Auditability of data collection
Data analysis	Credibility/confirmability of data analysis
Generalizability	Transferability



**Figure 1:** - Research critique framework

## Use of the framework

The framework is designed to be used both as a teaching tool and as an aid to assessment. One of the motivating factors for producing a framework was to provide clarity and to ensure fairness for those students undertaking a critical review of a research paper for assessment purposes. During our experiences of helping students to perform such critical review we had found that some students had been unable to discriminate between those questions that are appropriate to ask of quantitative research and those that are relevant to qualitative research. We hoped that by placing the questions that are appropriate for the respective research approaches in one single framework we would be able to facilitate the clarification of some of the theoretical positions that inform the respective research approaches and thus, in turn, aid understanding of the need to pose different questions. Thus, the framework can also be used in the classroom for facilitating learning, and as a tool for group activity.

Experience has demonstrated that it is the practice of critically reviewing a research report that is valuable in the learning process. Small group work provides the student with opportunities for rewarding engagements (Quinn, 1995), it allows students to work independently and to discuss and clarify learning. In small groups students have been provided with both quantitative and qualitative research papers and have used the framework and guidelines to produce their review. Feedback of the review to the larger group allows further discussion and development of knowledge and understanding.

The critique framework was used in teaching sessions with two groups of under-graduate nursing and health studies students and one small group of post-graduate students. Nineteen students completed an evaluation form. The numbers of students responding to particular questions on a 0 – 5 scale are shown in Table 2. Students were also asked two open questions:

- What did you like most about the framework?
- What did you like least about the framework?

**Table 2:** Evaluation of the Framework for Research Critique

	0	1	2	3	4	5
How easy was the framework to use? 0 = not at all easy; 5 = very easy			2	5	5	7
How useful is it to have a framework covering both quantitative and qualitative research? 0 = not at all useful; 5 = very useful				1	7	11
As a learning tool, to what extent did the framework help you to appreciate the features that: a) are common to all research? 0 = not at all; 5 = to a great extent				4	8	7
b) are specific to quantitative research?				3	13	3
c) are specific to qualitative research?				5	8	6
To what extent did the framework help you to carry out a critique of a piece of research? 0 = not at all; 5 = to a great extent				2	8	9

### What did you like most about the framework?

In response to the first question, the responses can be grouped under two headings: ease of use and practical application.

#### *Ease of use*

Students liked the presentation of the framework and described it as straightforward, succinct and precise. The fact that it fits on one page was pleasing to the students and there were also comments relating to its simplicity and brevity.

#### *Practical application*

Students found the framework easy to follow and understand, describing it as very easy and very helpful. They described the structure and the questions as good and stated that the framework will help them to advance their skills relating to the research process and methods. It was also felt that the framework provides a useful guide for critiquing research.

### What did you like least about the framework?

Some comments suggested that the framework was too short and could be more elaborate, but eight students stated that there was nothing they disliked about it.

## Discussion

We recognise that the comments presented here represent the contributions of a small number of self-selecting students and there is a need for a more systematic approach to the evaluation of this framework. This will be undertaken as the framework continues to be used in classroom activities with students. However, the current contributions from students do provide some early indications of the potential value of the framework.

Overall, the students found the framework easy to use and useful in terms of covering both quantitative and qualitative research and helpful when carrying out a critique of published research. Student responses to the framework were largely positive, suggesting that it is a

useful tool in aiding learning about research and in undertaking a research critique. The undergraduate students who used the framework are required to critique a piece of published research for their assignment in their research methods module and it is evident that they felt that the framework would help them with this task.

Students responded favourably to the questions relating to the features that are common to all research, quantitative and qualitative research. However, in this brief evaluation it was not possible to explore this further, for example, by asking them why their responses were positive or what in particular they found helpful. This will form part of further evaluation as the framework is used more widely.

Unlike some frameworks for research critique, this framework gives equal weight to both quantitative and qualitative research and uses the language of both paradigms. In this way, students do not attempt to critique qualitative research using a framework and terms originally designed for quantitative research.

While students could be referred to two separate frameworks, and students continue to be able to choose to use separate frameworks, we believe that the incorporation of the two approaches into one framework serves to assist learning and reinforces the differences between quantitative and qualitative research for the 'novice' student of research methods. Having acquired understanding at an introductory level, advanced frameworks are available for both research approaches when, and if, students require greater depth at a more advanced level of study.

## Conclusion

Though the framework and guidelines were initially designed for students working at both level two and level three, it has also been found valuable with more advanced students. Those undertaking masters level study are frequently given the more complex task of writing a critical literature review in preparation for a research proposal or research report. Those students who have not undertaken academic study for some time find this daunting, and often request revision. The framework has proved to be a useful tool in this activity.

For assessment at level two and three, students are frequently required to critically review a paper of their choice. Provision of the framework, with the assessment guidelines, provides a direction for all students. The inclusion of both strategies ensures that whatever the choice of paper all students have guidelines with which to work.

The framework, then, is of value in both teaching and assessment at level two and three, and is also a potentially useful teaching tool for masters level

students. It can be used as a teaching tool and displayed on an overhead projector or on PowerPoint. It can also be easily copied as a one page handout for students to work with in the classroom or to take away for study. Further use of the framework is required, but the intention is to place it on WebCT, with the guidelines available as 'clickable links'. As such, it will also serve as a revision aid and will allow students to test their own knowledge, clicking on those areas where they feel they need further explanation. The next stage is to facilitate a more systematic evaluation of this framework: we also welcome comments from our colleagues.

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## BOOK REVIEW:

# Scriven, A. & Garman, S. (Eds) (2005) Promoting health: Global perspectives. Palgrave MacMillan. (ISBN 1-4039-2137-7)

*Daryl Evans, BSc, MA(Ed), RGN, RNT, DipNEd, Principal Lecturer, Programme Leader Health Promotion, School of Health and Social Sciences, Middlesex University*

This book is an excellent overview of health promotion development and practice across the world. Angela Scriven introduces the reader to global approaches in health promotion firstly through common and universal trends such as inequalities and the development of the discipline, secondly through major health challenges such as food, tobacco, HIV/AIDS and climate change and finally through the differing discourses on health promotion in a wide selection of countries and continents.

The contributors are an international cast, distinguished by specialist qualification, expert practice and breadth of view. The whole is interdisciplinary and international, providing an insight into the imperatives of global interconnectedness.

One aspect of being connected is the recurring theme of degree of adherence to the Ottawa Charter principles, a clever device to remind the reader that every country has its own history of health improvement, which should not be buried beneath the received wisdom of the modern approach. A sobering thought for Europeans is the criticism of a lack of strong development across Europe, whereas the Latin American and African experiences are of recent moves to unification, although not without problems.

The book also poses the question, at times overtly, as to the necessity for health promotion in its present guise. Whether or not health education alone or healthy public policy alone could be as effective is another theme, quite rightly challenging health promotion professionals and academics to revisit the discipline in the light of this global overview. The writers are justifiably critical of some of the directions and shortcomings of health promotion, at the same time entering the debate about the provision of evidence for health promotion principles and practice.

This is a challenging read which delivers a series of focussed analyses of health promotion in and across different countries, which is not easy to pick up

elsewhere. Students of health promotion and public health will find the book an in-depth introduction to international comparison and global similarities, which at the same time helps them to question the future of health promotion itself.

### Reviewer

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# BOOK REVIEW: Charles Kemp & Lance Rasbridge (Eds) (2004) Refugee and immigrant health: A Handbook for health professionals. Cambridge University Press (ISBN: 0521828597)

*Hjordis Fedorowicz, MA, ATR, BC, Louisville, USA*

This elegant, comprehensive and timely work builds on the extensive cross cultural healthcare literature established by Rasbridge and Kemp, and is conveniently divided into two sections:

The first section defines terminology and concepts, and covers broad and background information on issues associated with refugees and immigrants arriving from the developing world. Chapters on physical and mental health concerns specific to refugees and immigrants, prepare health and other professionals for problems encountered in these populations. The section concludes with two chapters delineating religious influences on health, and particular issues related to women.

The second section details the health beliefs and practices of 30 cultures and populations commonly encountered in refugee or immigrant health situations in the developed world, and includes Cambodian, Egyptian, Central American, Chinese, Nigerian, Roma, and 24 others. Each of the last 30 chapters has population-specific information on background, history of immigration, culture and social relations, communications, religion, health beliefs and practices, pregnancy and childbirth, end of life, health problems and screening issues (the latter is focused on infectious diseases).

The book is straightforward and is written by health care providers for health care providers and health professions students. It will serve readers in both practice and academic settings as a reference volume to provide more culturally appropriate healthcare

## **Reviewer**

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# CONFERENCE REPORT: Recipes in early modern Europe: The production of medicine, food and knowledge, 13-14 February, 2004, Oxford, UK

**Anne Stobart,** *MA, MNIMH, Human and Healthcare Sciences Academic Group, School of Health and Social Sciences, Middlesex University*

This conference, organised by the Medicinal Receipts Research Group, was the first conference to bring together researchers from a diverse range of disciplines sharing a common interest in the historical study of recipes, or receipts, primarily medicinal but also culinary and household recipes. Research using recipes has been somewhat negligible until recent years despite the existence of numerous printed and manuscript collections from the early modern period. Attended by over 50 delegates, this conference in Oxford provided a unique opportunity for researchers from literary, linguistic and historical backgrounds to present information on their current work and discuss their research.

The study of recipe collections in classical and medieval times was a theme. Lawrence Totelin of the Wellcome Trust Centre at UCL began with a review of the Hippocratic Corpus and the links between medicinal and culinary recipes. It seems that many home remedies were more complex than previously thought and required exotic and costly imported ingredients. Carmen Caballero-Navas of Granada University, Spain, considered recipes in thirteenth century Hebrew texts, the methodology involved in the study of women's networks, and the influences shaping recipes. As recipes passed into different hands they changed due to translation or other reasons but the actual use of remedies was obscured by the 'masculinisation' of these texts over time. Montserrat Cabré of Cantabria University, Spain, further discussed the nature of medicinal recipes as women's texts and considered the recipe collections of lay women between 1375 and 1550, outlining changes of types of collections from those dedicated to women of status to open-ended handbooks which could be added to by women as time went on. Ruth Carroll of Turku University, Finland, was able to provide a close linguistic analysis of recipe structure in Middle English, pointing out how atypical recipes were in comparison to other medieval texts. She regretted the frequent loss of information in transcriptions and editions of manuscripts resulting from modernisation of spelling and changes in layout. Medieval English herbals

have been closely examined by Martti Mäkinen of Helsinki University, Finland, for inter-relationships of the recipes contained with other medical texts and connections with remedy books. Further detailed analysis comparing the structure of alchemical recipes in England in the fifteenth and sixteenth centuries was provided by Peter Grund of Uppsala University, Sweden.

Connections between recipes and other aspects of culture were made in a number of important ways. Yari Perez-Martin of Brown University, USA, described the 'New World Medicine Chest' written up by a travelling sixteenth century surgeon and the influences on this work of Spanish and Mexican traditions and vice versa. Catherine Field of Maryland University, USA, discussed power relationships and the sexual connotations of the healing activities of Helena in 'All's Well that Ends Well' in which she cures the King of France of a (probably anal) fistula. David Goldstein of Stanford University, USA, entertained us with reflections on 'How to make a bisk' – originally a flamboyant soup of many types of poultry requiring complex preparation and in some ways reflecting the integration of different cultures of the early modern period. Dana Sonnenschein of Connecticut State University, USA discussed the examples of women's healing practices within early modern literature and noted the fear of women's power in a healing role.

There has been more recent study of the recipe collections associated with women in the early modern period. Elaine Leong of Oxford University described the reading practices of a number of collectors of medicinal recipes with an extensive analysis of the sources used. Differences in the way that collections were organised can be identified and raise interesting questions about the medical knowledge of the household compared with learned medical texts of the period. Sarah Pennell provided a thoughtful overview of recipes and dietary regimens, exploring the connections between medical and culinary activities. My own paper fitted into this section. In it, I explored changes in the use of the technique of distillation in the preparation of early modern household medical items such as cordials and

distilled waters, using recipe collections based in the South West of England.

Treatment of the poor in seventeenth century France was discussed by Lisa Smith of Saskatchewan University, Canada, particularly in relation to the construction of medical authority and the involvement of men and women in validating the use of remedies through testimonials. Alisha Rankin of Harvard University, USA, has explored the reasons why, in Germany during the same period, there was a striking lack of printed medical works by women although many such works were dedicated to women and many women were active in medical matters. Layinka Swinburne of the Thackray Museum in Leeds explained how in England in the sixteenth century a 'new' disease emerged in children and was eventually described and named as rickets. Affecting the rich rather more than the poor, being due to dietary and lifestyle differences, the disease led to the development of a variety of lay remedies and learned treatises.

Different practitioners within the history of medicine were also well represented. David Gentilcore of Leicester University described his work on Italian charlatans between 1540-1790 and their licensing to sell patent remedies. Patrick Wallis of Nottingham University raised some historiographical issues relating to the study of apothecaries receipts, and outlined the uneasy relationship between physicians and apothecaries in seventeenth century London. John Henderson of Birkbeck College provided a detailed breakdown of medical activities revealed by the records of a hospital in Florence in the early sixteenth century which describe the pharmacy stock and conditions treated. And James Shaw of Sussex University further described the apothecary shop records of Renaissance Florence noting large differences in the treatments given to rich and poor, and a period of apparently increasing standardisation of treatment.

The above brief description barely does justice to the wealth of information and ideas aired and discussed at the conference. The study of receipts can provide us with a richly rewarding window onto beliefs and practices relating to medicine, science, culture and other aspects of society. This gathering of scholars in the field will surely have provided an excellent basis for further contact and development.

The conference was generously supported by the Wellcome Trust, the Royal Historical Society, the Modern History Faculty of Oxford University and the Wellcome Unit for the History of Medicine at Oxford. It was agreed that an e-mail discussion list would be established to help support further contacts. Anyone wishing to find out more about the Medicinal Receipts Research Group is welcome to contact me.

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# CONFERENCE REPORT: Interpreting emotional states: A review of two recent conferences

American Association for Artificial Intelligence, Stanford University,  
22-24 March 2004, Palo Alto, California USA

International Society for Research on the Emotions - 25-29 June  
2003, Cuenca, Spain

*Mark Coulson, BSc, PhD, CPsychol, AFBPsS, ILTM, Principal Lecturer in Psychology, Psychology Academic Group, School of Health and Social Sciences, Middlesex University*

Interpreting the emotional state of other people is something we all do every day: it is arguably a key ingredient in any successful interaction. Our folk theories of behaviour suggest that the way a person is feeling affects how they will behave, and that our own behaviour is interpreted with respect to the other person's emotions. Although we may not be conscious of doing it, we are constantly monitoring our own and others' emotional states, and, as expert observers, we all bring a lifetime of acquired (and perhaps innate) knowledge to this task. Just as we draw effortlessly on the complex rules governing the use of our spoken and written language, so there must be 'rules', however poorly formulated, for understanding the language of emotional expression.

One aspect of this – how body posture and movement communicates our emotional state – has been studied by our group. This paper reports on two recent conferences which attempted to bring together scholars interested in the nature of emotion, and considers a new synthesis which may integrate and resolve some of problems of modelling and understanding human emotion.

## Who studies body language?

Dancers and actors need to be aware of their movements and how the nature and quality of these are perceived by their audience. If a performer is tense or nervous, this may show through in their performance. Actors may make use of Stanislavski's 'method' whereby past events associated with a specific emotion are brought to mind, with the result that the emotion is re-experienced and (more or less genuinely) expressed. There is evidence which suggests that dancers portray 'nice' characters using open, round postures, and 'nasty' characters using

sharp and angular ones (Aronoff, Woike & Hyman, 1992). While there are some systems which attempt to formalise the way in which emotion is communicated in performance, much of the knowledge is implicit, learned through personal experience and practice, and as a result, the movements themselves are typically very idiosyncratic although they may communicate emotion successfully (Wallbott & Scherer 1986).

A large and growing industry of computer-generated films and computer games has drawn on the talents of programmers and animators skilled in anatomy and expression and who are able to model emotional states: their task is to take human (and often nonhuman) forms and instil in them expressions which seem natural and real. There are complex factors at work here – our susceptibility to human movement is so acute that we can identify the sex and approximate age of another person by viewing a series of moving dots (actually reflective blobs attached to the joints of a moving person) for a couple of seconds (Johansson 1973), and any deviation from expected values can have dramatic effects. For instance, when viewing a walking figure from the side, the shoulders and hips describe elliptical patterns of movement whose relative size specifies the sex of the walker (men's shoulders are generally wider than women's, and describe larger ellipses than the hips). Interestingly, as the relative size of the ellipses changes, the resulting gait is seen as increasingly masculine or feminine but also as less and less natural (Cutting, 1978).

Although a great deal is known about how to make virtual characters move in realistic ways, as evidenced by the success of recent films such as *Shrek* and *The Polar Express*, most of the animation is produced using motion capture systems which take the movements of real people

and digitally map these onto the virtual characters. While this process involves a great deal of technological sophistication, it is not based on what we might consider a 'deep' understanding of the relationship between movement and expression. Such an understanding would bypass the need for motion capture, as the implicit rules governing the dynamics of body language would be rendered explicit. Achieving this goal would be of tremendous significance not only for those who work within the relevant industries - imagine the benefits of a system which could interpret a command such as 'make Shrek walk in a disappointed way' - but is also the direct concern of academics working within the broad area of emotional expression and perception.

## A multi-disciplinary subject

Getting academics and practitioners together from different fields to work on a common problem can be productive, and two recent conferences have provided excellent examples of how this multi-disciplinary approach can bear fruit.

The American Association for Artificial Intelligence (AAAI) 2004 Spring Symposium series ran a three-day symposium entitled 'Architectures for Modeling Emotion: Cross-Disciplinary Foundations'. The papers ranged from system-level implementations of human computer interfaces, through theoretical work on what exactly needs to be simulated when simulating emotions, and on to more product-focused systems such as those currently under development for training personnel how to spot and defuse high stress encounters.

A recurrent theme at this symposium concerned the role of emotions in guiding intelligent behaviour. It is only really in the past two decades that emotion has come to occupy a central position within psychology and cognitive science. Until then, Descartes' legacy, that thought could be studied in a pure sense and emotion was an unruly and disrupting influence, had held sway. The publication of Antonio Damasio's book *Descartes' Error* (Damasio 1994), saw emotion reconceptualised as an organising and driving force behind thought and behaviour. Indeed, as William James observed over a century ago

If you can conceive yourself, if possible, suddenly stripped of all the emotion with which our world now inspires you ... no one portion of the universe would then have importance beyond another; and the whole character of its things and series of its events would be without significance, character, expression, or perspective. (James 1890).

If the 'whole character' of the world is 'without significance' then, according to Damasio, nothing

matters more than anything else - if no one thing has greater value than another we cannot express a preference, and preference can be intimately involved in decision making. Patients with damage to the brain's anterior frontal lobes have unimpaired intelligence (as measured by standard tests) but frequently make disastrous decisions as they seem incapable of emotionally evaluating risky or unwise decisions. Such observations were instrumental in placing emotion right at the heart of intelligent thought.

While no-one seriously doubts the influence of emotion on thought, a provocative and recurring theme at the AAAI conference was whether emotion was actually *necessary* for thought (see Sloman, 2004, for a more extended discussion of this). If thought *needs* emotion then intelligent systems need to include the sorts of components which respond to emotion-generating stimuli in appropriate ways. If, however, it just so happens that a species with both intellect and emotion will experience interference, with one getting in the way of the other from time to time, then building the latter into systems designed to generate the former may prove disastrous.

The International Society for Research on the Emotions (ISRE), although somewhat dominated by psychologists, has a mission to provide a forum where 'researchers from various disciplines can come together to discuss issues of mutual concern'. Interestingly, although ISRE is the premier academic society for research in emotion, its conferences are not characterised by the same degree of critical questioning evident at the AAAI meeting. Although sessions were themed, they tended to focus on new empirical findings, and, with a few notable exceptions, did not question the generally held view of emotions as discrete states which correspond closely to the words we use to identify them.

## A componential view of emotion

One counterexample to the generally conservative content of ISRE lies in the iconoclastic work of Russell (1995; Russell & Barrett 1999) which has almost single-handedly forced researchers to keep questioning (or at least have questioned) some of their cherished beliefs. At the conference, Russell likened emotions to astrological constellations (i.e., that they have no existence nor do they produce causal effects). Emotions do not really exist, they are just things we have given names to because they are salient to us. We also bestow all sorts of causal powers on them - they make us do things and we explain our behaviour and the behaviour of others using the language of emotion. However, they are illusions.

Although astrological constellations are inventions, and have no power except that which our belief systems bestow upon them, they do consist of very real components. For emotions, which like star signs are

illusions with no real existence except for their prevalence in theoretical explanations of behaviour, the components are a mix of perceptions, evaluations, memories, physiological changes, preparedness to act, internal plans and goals. It is the momentary coincidence of a subset of these which we call an emotion, but it is the components themselves which are the driving force, not the emotion itself.

Why does this help us understand emotional expression, and in particular expression through the body? Work in our research group (Coulson 2004; Coulson, in press) has examined how processes which evaluate an event or stimulus (commonly referred to as appraisals, Lazarus, 1991), may have direct effects on the musculature of the body which gives rise to coordinated patterns of movement that may be labelled as emotional expressions. To make this more concrete, imagine the sequence of rapid unconscious thoughts which might go through your head when you hear a sudden noise outside your bedroom window at three in the morning. According to an influential theory of emotion put forward by Scherer (1987), this event is processed in terms of four objectives (is it relevant, what are its implications, can we cope with these, and do they impact upon our understanding of what is normal). Each of these objectives is further divided into more fine grained analyses which constitute the individual appraisals.

A sudden noise is rapidly appraised as something novel, intrinsically (and usually) unpleasant (there is strong evidence to suggest they have an effect on us before we are even aware of what they are; Le Doux, 1994), relevant to ongoing concerns (trying to get a good night's sleep), and as caused by an, as yet unknown, agent with unknown intentions. The significance of these appraisals is that each one has potential implications for what you should be doing right now. If something novel occurs (and generally we only experience emotion in the presence of something novel, be it external or internal), we might orient towards it. If it is unpleasant we might withdraw from it, and so on. Each appraisal has an immediate and functional effect on the body, and by simulating these we can create bodily responses to appraisals which appear to experience emotion. By simulating a sequence of movements we have been able to show that functional responses to significant and novel stimuli may be perceived as emotional expressions (Coulson, in press).

But of course they aren't expressions of emotion. Although a specific sequence of appraisals may result in an emotion, and its associated experience, the expression is the direct result of the appraisals. As William James first observed, it is not the case that we see a bear in the woods, feel afraid, and run away, but rather that we see a bear, run away, and the experience of running away IS fear. Where does this leave our understanding of how people express emotion through their bodies?

## Towards new models of emotion and behaviour

The simulation work outlined above represents an interesting beginning, but it is incomplete in many ways. Although expressive body movements may be the result of moment by moment sequences of appraisals, this cannot be the full story. Take, for instance, the likely reaction to being confronted by a person waving a knife in your face. There are elements about this scenario which we would probably all agree would lead to fear, but specifying the physical response to this event is aided not one bit by this knowledge. The following contexts are only a few which might constrain how we feel about our encounter with the knife-toting assailant:

1. You are on your own, late at night, down a dark alley in an unfamiliar town.
2. You are with a person you know will protect you no matter what.
3. You are with your own child.
4. You've got a gun.

Our physical response to the same stimulus is likely to differ radically in each of these situations. It will also depend on who you are (your personality), your current state and goals, the physical context (e.g. whether turning and running is an option), and so on. In short, if we are to develop a theory which specifies how people's bodies move in emotional situations, we need to model pretty much everything about them and their situation. The only thing we know which does *not* need including in a model of emotional expression is the emotion being experienced!

There is a sense in which this approach may resolve the objections raised by Sloman and Russell. What we are addressing is not the effects of emotion, because emotion does not really exist and is therefore not necessarily involved in anything. Rather, there is a whole series of contexts which jointly specifies how we behave in any given situation, and although these include information about our needs and desires which are traditionally held to be the realm of emotion and affect, they are not in themselves emotions. The task for the future lies in specifying the components and how they individually and collectively interact to produce functional and meaningful action.

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