To begin, can you outline your professional background and how you became interested in ethics education?

I earned my PhD in Industrial and Organisational Psychology and Psychometrics from the University of Georgia, USA, and am now a professor of psychology at the University of Oklahoma, USA, and Director of the Center for Applied Social Research. My initial interest in ethics began when conducting research in the Office of Naval Research examining the use of life history data in the assessment of people for security clearances. This work resulted in sweeping changes in the security clearance process and reflected that ethical issues involving security breaches were more complicated than was previously thought.

What are the core aims and objectives of your research in this area?

We aim to identify educational interventions that will reduce unethical conduct by scientists. To those outside the sciences, it can appear that the kind of misconduct scientists engage in is trivial because it is ‘just’ journal articles. However, these articles are read, and they inform public policy.

Why does the use of emotional case content in ethics education improve the application of ethical decision-making principles?

Emotions are inherent in ethical decision making and are a source of information that is stored in case-based knowledge; therefore, cases become more realistic when they include emotion content. In turn, more realistic cases lead to better knowledge retention and enable a more effective transfer of this knowledge to real-world ethical dilemmas.

What encouraged you to choose a sensemaking approach to ethics training for scientists? How did you develop the course and what were the outcomes?

We chose a sensemaking approach because graduate students are intelligent but also subject to numerous sources of pressure: obtaining data, fulfilling academic requirements, getting a job and so on. All these pressures obscure their ability to make good ethical decisions. The sensemaking approach does not tell people how to behave; rather, it provides people with strategies for better understanding the context in which they are operating.

Another reason we chose the sensemaking approach is because ethical rules – such as only being able to publish one article per dataset – often change. When using educational strategies that are effective in the long term, a framework must be created that can adapt to changing rule systems.

Can you outline the approach you take when creating an evaluation strategy for ethics education programmes?

The assumption that is frequently made with ethics education is that because we are teaching people ethics, it is inherently valuable; therefore, trainees will automatically learn and apply the content. However, teaching attempts...
do not equate to learning. A similar assumption is often made with leader development programmes – leadership is inherently valuable; therefore, the provided instruction will automatically be learned and applied. Unfortunately, it is not this simple, which is why evaluation is so important.

The aim of programme evaluation is to determine that the instruction is effective and to provide feedback for the purpose of continual improvement. The approach we take in our ethics education programme reflects the best practices in industrial and organisational psychology: evaluation is conducted with respect to actual work; students’ reactions to the training content are accounted for; effects of the training on the broader institution at hand are examined; and multiple criterion measures are used. A well-designed evaluation system will help improve the training programme – and with continuous improvement and evaluation, we may eventually establish the kind of educational programmes that allow us to have confidence in how we train the next generation of scholars in the responsible conduct of research.

What obstacles are faced when applying ethical decision making to the science field?

The key obstacle for many, many years has been that ethics was exclusively within the domain of philosophy, as opposed to the social sciences. Philosophers create absolute standards for conduct, but science is – by definition – dealing with novel and ill-defined phenomena, which means that absolute or fixed standards cannot be implemented. As a result of philosophy’s strong influence on ethics, there has not been a comprehensive research base in this area – until recently. To understand this, one may consider that psychology has been an identifiable discipline since the 1880s, but there has not been a psychological study of ethics since Dr Lawrence Kohlberg in the 1970s and 1980s.

MAINTAINING RESEARCH INTEGRITY is paramount to scientific progress. Research misconduct devalues the importance of science and reduces public trust in scientific ventures, as well as stunting scientific development and potentially causing real-world harm. Defined as the fabrication, falsification or plagiarism of any type of scientific research – including reports and reviews of previous work – research misconduct remains a serious issue within the scientific community, accounting for nearly 50 per cent of all scientific paper retractions.

Despite the development of communication technologies that have the potential to examine whether research misconduct has taken place, scientific misconduct appears to be on the increase. In the past, shocking events, ranging from the death of study participants to the extreme falsification of data, have called into question scientists’ abilities to engage with ethical problems. A primary example of this is the infamous research paper published in 1998 claiming an association between the combined measles, mumps and rubella (MMR) vaccine and the development of autism, which led to a severe drop in MMR vaccination rates that in turn caused numerous fatalities. While these rare instances of gross misconduct have always been placed under close scrutiny, it has recently become clear that minor instances of misconduct may be far more prevalent than previously assumed.

In an effort to combat these rising incidences of science misconduct, Dr Michael Mumford, Director of the Center for Applied and Social Research at the University of Oklahoma, has produced a comprehensive ethics training programme to improve research integrity in science. Such training is now more important than ever, with researchers being placed under increasing pressure to perform: “The stakes are now higher, with scientists no longer content with just a job and a pay check. Moreover, the current structures for career success (such as publishing practices and funding) are set up in such a way that they exacerbate the problem,” Mumford explains. With this in mind, new scientific research must come under closer scrutiny to maintain its integrity and ensure it has a positive impact on society.

IMPROVING ETHICAL DECISION-MAKING PRACTICES

While a greater emphasis has been placed upon ethics training for R&D professionals in recent years, there have been various claims as to the best approach to ethical decision-making (EDM) training. The most widely applied approach is Drs Lawrence Kohlberg and James Rest’s theories of moral
INTELLIGENCE

BIAS AND BIAS MANAGEMENT IN ETHICS EDUCATION

OBJECTIVES
- To identify educational interventions that will reduce science misconduct
- To develop an effective ethics education programme for scientists
- To create training methods that combat the influence of biases in ethical decision making

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reasoning that were developed in the 1980s, which assess the process by which an individual is able to determine what is right and wrong in a personal situation using logic. In the early 1990s, Drs John Gawthrop and Max Uhlmann applied a field practices approach to EDM, focusing on the implementation of specific instructional methods such as field-specific codes of conduct, guidelines and decision-making tools. This approach was shown to improve the quality of ethical decisions made upon a set of vignette exercises, but has not yet been widely applied. In 1996, Dr Robin Deutsch applied a case analysis approach to EDM, where an exhaustive list of different instances of research malpractice were closely analysed to determine the common causation factors of scientific misconduct. This approach shed light on a number of factors, but has not yet been empirically tested.

While moral reasoning provides a strong basis for the implementation of an EDM curriculum, there are other methods that can be used to develop a complete curriculum that takes into account multiple approaches to training and implementation. Mumford and his researchers are working on achieving this goal by developing a comprehensive model curriculum for training in research integrity that highlights the importance of EDM in future scientific practice. As new practices or data on current practices come to light, the model will be updated to incorporate these changes: “We continue to enhance our ethics education programme through ongoing research,” Mumford states.

So far, the researchers have conducted numerous studies into the efficacy of EDM training measures in lessening the potential for research misconduct across the board. These studies include: assessing the impact of situations and individuals upon research outcomes; using metacognitive strategies to improve individual’s contextual understanding of their research; and applying the sensemaking approach to ethics training to provide qualitative evidence. Mumford’s team hopes this model curriculum will provide a basis for controlled and effective EDM training for young scientists, particularly doctoral students in health, biological and social sciences.

THE SENSEMAKING MODEL

To promote responsible conduct of research and EDM, the researchers are carrying out studies using a sensemaking framework. This framework presents scientists with four considerations that enable an initial assessment of a situation: responsible conduct of research principles, perceived causes of the situation, professional and personal goals, and perceived requirements for attaining goals, it then prompts them to define the exact nature of the situation through contextually framing the problem and identifying any emotions that are produced by ethical dilemmas. This enables scientists to search for similar past cases to provide a frame of reference and develop a mental model of the situation. Case-based training, where an individual learns from their own or others’ past experiences, has been found to be particularly useful for improving effective sensemaking.

BIAS AND BIAS MANAGEMENT

Ethics education leads people to recognise and manage ethically high-risk situations, but the problem of personal or institutional biases can still have an impact on research integrity. The three most prevalent biases in university-based ethical decision practices are the misapplication of principles (including failure to correctly apply principles and lack of knowledge), moral insensitivity (a failure to recognise and assess the ethical implications of a given situation) and inappropriate framing, when a situation is inappropriately defined as lesser or greater than it truly is.

Mumford and his team are especially dedicated to finding training methods that counteract the influence of biases on EDM. They are currently in the process of measuring these biases and finding ways to mitigate their effect. So far, they have found that individuals can be trained to recognise their own biases and employ the necessary compensatory strategies to improve ethical judgements. A recent study in 2014 involved an educational intervention where trainees were exposed to a broader ethical training framework with exercises involving self-reflection, forecasting and sensemaking. The results were very positive, with self-reflection being identified as the most effective exercise. Furthermore, trainees were shown to be able to identify their own biases and, from this, make better ethical decisions concerning their own work.

DEVELOPING A RESEARCH BASE

As ethics education is still a relatively new field, it is crucial that a comprehensive research base of EDM studies and a compendium of effective training methods are developed as soon as possible. “Ethics education will become more fundamental to science education, so it is imperative to learn to do it well,” Mumford highlights. “At present, however, research is lacking.” The Oklahoma team is now targeting research endeavours on previously unexplored areas of ethics education with a focus on developing educational practice. They are currently in the process of conducting a meta-analysis of around 200 ethics education programmes to identify effective instructional practices, as well as examining the importance of mental models and EDM in these programmes. The researchers continue to counteract the current incentives for unethical conduct by providing future scientists with a greater contextual understanding of the potential implications of scientific misconduct, and hope that their work will reduce research misconduct in all disciplines.