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Why teach intelligence?☆

N.J. Mackintosh *

University of Cambridge, UK

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ABSTRACT

IQ tests are one of psychology's more visible and controversial products. For this reason alone, a student who has graduated with a degree in psychology ought to know enough about the subject to dispute some of the public's misconceptions. Controversy breeds disagreement, and although intelligence researchers are agreed on some of the conclusions suggested by their research, they disagree strongly about others. One reason is that many see desirable or undesirable implications of such research, and their evaluation of the research is influenced by those perceived implications. Another is that the nature of intelligence research, where well-controlled experiment is usually not possible, and conclusions are based on mere correlations or the results of necessarily ill-controlled natural experiments, means that not all conclusions are unequivocally dictated by the evidence. For these reasons an advanced course on human intelligence can teach a student how to evaluate necessarily ambiguous evidence, without being swayed by his or her prior beliefs or wishes.

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1. Introduction

It seems reasonable to start on a personal note with my own experience of teaching intelligence. I have taught courses on intelligence at Cambridge for the past 30 years, an advanced final year undergraduate course throughout that time and also, until 10 years ago, a few lectures as part of introductory psychology courses to scientists and medical students. On the whole the lectures have been well received — the main exception being a (thankfully) small minority of medical students who, facing exams in anatomy, physiology, etc., which, if they do not pass well, they will have to resit, have resented the time wasted sitting through any psychology lectures[1]. Of particular relevance to the concerns expressed by the editor when compiling this special issue of the journal, the advanced final year course, although optional, has always been very popular, regularly attracting well over half of the students taking psychology in their final year. This has been in a department of experimental psychology, with a strong emphasis on behavioral and cognitive neuroscience, sensory psychology and animal behavior, which, until very recently, provided essentially no teaching in social psychology or personality. I take little credit for the course's popularity: I am certain that it is the course's subject matter that attracts the students. I think that any such course can be guaranteed to be popular. Perhaps we should listen to what students want.

The structure of the course in recent years (although of course it varies from year to year) is roughly as follows. I start with a bit of history, noting the unfortunate timing that saw IQ tests being first developed when the demographic transition was causing people like Raymond Cattell to worry about the decline of national intelligence. This leads naturally into a discussion of the Flynn effect, which leads into a discussion of environmental and social class effects on intelligence, which leads into a discussion of heritability. This is usually followed by group differences. My intention is to attract students by beginning with the more visible (controversial?) aspects of the subject, before hitting them with factor analysis and the structure of human abilities; processing speed and changes in intelligence with age; the relationship between IQ and executive functions such as working memory; the brain; and

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* Department of Psychology, Downing Street, Cambridge CB2 3EB, UK.
E-mail address: njsmm10@gmail.com.

[1] My favorite example of a dissatisfied student was the one who wrote in his evaluation of my first lecture: 'Professor Mackintosh has been talking for 40 min, and he still hasn't said anything interesting'.

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finally a discussion of the predictive validity of IQ scores and the possibility that IQ tests fail to capture all important aspects of human intelligence: this includes a brief mention of Gardner's multiple intelligences, but more emphasis on social, emotional and practical intelligence and the role of expertise (it is in these last topics that I suspect many psychometricians would find much to disagree with).

I do not hesitate to discuss controversial issues (such as sex differences for example), because I find that most students want to learn about them, and I want them to learn how to evaluate scientific findings without regard to their own personal prejudices (see below). I try to encourage them to reach their own conclusions. Although I do introduce them to factor analysis, I spare them much mathematical detail: even though most of them have a relatively strong scientific background, long experience has taught me that, if I want to keep students in the class, this is a sensible decision. I do not doubt that research in intelligence requires a proper understanding of factor analysis and psychometrics. But this is, after all, an undergraduate, not a graduate, course.

I also give talks to 6th form (high school) students, to various university and other societies, and to the 'University of the 3rd Age' (older people keen to maintain their intellectual curiosity).

2. An obvious reason for teaching human intelligence

An obvious reason why all psychology students should be exposed to an advanced course on human intelligence is that this is an area where significant progress has been made in the past 50 years or so, and many of the important findings of this new research are unlikely to be taught in an introductory course. One version of this argument suggests that there is now general consensus among intelligence researchers about many of the issues that were once bitterly disputed (Neisser, 1996), but this general consensus is still widely misunderstood.

There are other reasons. One is that cognitive psychologists/neuroscientists and intelligence testers actually share some common interests and should sometimes have a common research agenda. Each party therefore needs to know more about the other. For example, in spite of the well established relationship between IQ and working memory, measures of either Gf or Gc appear to be only weakly related to other so-called executive functions (Ardila, Pineda, & Rosselli, 2000; Friedman, Miyake, Corley, et al., 2006). One interpretation of this finding is that 'psychometric intelligence tests do not appropriately appraise intelligence. Or, at least, they are not appraising abilities that, from a neuropsychological perspective (and also, from the point of view of Wechsler's intelligence testing), should be understood as the most important elements in cognition' (Ardila et al., 2000, p. 35). This is clearly a message that intelligence testers should take on board. But the claim that tests of executive function measure the most important elements of cognition needs much stronger justification than Ardila et al. (or Friedman et al. who advance a similar argument) have provided. There is an unfortunate air of confrontation in their claims, which is hardly helpful. Is it reasonable to suggest that it stems from a mistrust of intelligence testing that might be alleviated by more teaching of the subject?

This is not, however, the only reason for believing that many psychologists would benefit from an advanced course on intelligence. I want to advance a rather different argument, one which may be seen by some as an attack on intelligence research. It is certainly not intended as such.

I start with a relatively uncontentious point. For better or worse, IQ tests are one of the more visible products of psychology; the nature of intelligence is a topic of widespread interest; and the possibility that people might differ in 'native intelligence', and the possible causes of such differences, often arouse fierce discussion. Many readers of this journal will argue that the public is seriously misinformed about these topics, citing Snyderman and Rothman's (1988) excellent book in support of their argument. I do not wish to dispute their point, but it can wait. Whether or not the public is misinformed, students who have graduated from university with a degree or major in psychology ought surely to be a great deal better informed about a topic of such widespread interest than members of the general public. They will not be, if all they have learned is from a chapter in an introductory textbook or a couple of lectures in Psychology 100.

At best, such students will have learned that intelligence tests were first developed by Alfred Binet, and will have been shown some examples of such tests; they will have learned that intelligence is affected by both genes and environment, and with luck that heritability is a population statistic, which does not refer to the proportion of any individual's intelligence that is determined by her genes or her environment. They will have heard of *g* and of multiple intelligences and have been told about test reliability and validity, and that IQ predicts educational attainment. This is all fine — but it is not very much.

Would such a student be able to argue with a critic like Murdoch, who claims that IQ tests 'do not test intelligence and have negligible ability to predict academic achievement' (Murdoch, 2007, p. 231), or others who assert that the only reason why they predict any other accomplishments is because they are disguised measures of social class or family background which are the real determinants of such accomplishments? Sackett, Borneman, and Connelly (2008) provide a number of examples of such claims. It is not necessary to insist that the critic is clearly wrong — only that there are at least some counterarguments which can be deployed against his position, and that a well educated psychology graduate should be able to advance some of these counterarguments.

3. The preconceptions (and ignorance) of other psychologists

I suspect that relatively few academic psychologists can or would. It is not only the public that harbors some misconceptions about intelligence tests but also other psychologists. Most experimental psychologists take a decidedly dim view of intelligence testing: being one myself I am familiar with their attitude. When, in 1972, Leo Kamin gave an address to the Eastern Psychological Association (later expanded into a book, Kamin, 1974), in which he denounced Cyril Burt and concluded that 'there exist no data which should lead a prudent man to accept the hypothesis that I.Q. test scores are in any degree heritable' (p. 1), he received a standing ovation at the end of his lecture. When I was writing a review of his book (Mackintosh, 1975), I discussed it with several of my experimental colleagues, and was astonished at their unwillingness to dispute some of his more suspect arguments, or to

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