A new book by Robert Sternberg is an event to look forward to. The latest, *Applied Intelligence*, written with James C. Kaufman and Elena L. Grigorenko, is a text intended for undergraduate and graduate students, and as such it is written in a style that is exceptionally accessible. Moreover, the book is thorough in its coverage, well structured, and potentially very useful for anyone looking for a good source of up-to-date information on the state of the science of theorising about and measuring cognitive capacity.

Intelligence as a topic of interest seems an obvious focus to those of us reared in the Western cultural tradition. A vast industry exists in developing, testing, and refining measures of cognitive ability, and publishing about related issues. However, while for many, devising ways to assess an individual’s cognitive capacity is essential, to other interested observers the whole notion of intelligence seems a tyrannical imposition. For a considerable number of classroom practitioners and those who teach and advise them, for example, the use of standardised tests of student ability is to be resisted.

The “bad name” that intelligence tests have can be better understood by looking a little closer at dominant models of human capacity. Carol Dweck (to whom Robert Sternberg and his co-authors refer in the book reviewed here) and her colleagues propose that people conceptualise human attributes, intelligence included, as either entities (fixed traits probably present from birth and biologically based) or processes (malleable qualities that can be influenced and shaped by effort and experience). English-speaking cultures are dominated by entity theories of intelligence, which imply that children are born with a fixed quantum of ability that is resistant to environmental influences. The whole notion of a test to measure intelligence implies a bounded “thing” rather than dynamic process. The model of attributes as entities seems to be particularly dominant in individualist cultures, such as our own, which undoubtedly goes a long way to explain the success of the “IQ industry” in Anglophone countries.

For many educators, whose work is concerned with nurturing the individual development of their students, this “theory of limits” is most unpalatable. This is particularly so in those cases where theories of intelligence have been used to “write off” whole groups as “less able” than others, with the most notorious being attempts to rank ability by “race.” In contrast those who subscribe to process models of human attributes emphasise the importance of hard work and good teaching in the development of human capacity and in this many educators find a more congenial model, one of human possibilities rather than limits.

Sternberg has spent his eminent career researching and advocating for alternative conceptions of intelligence to the mainstream psychometric (entity) model. The first conceptually sound measures of “IQ” were developed in France by Binet and Simon with a specific purpose in mind, that of screening children to see which would not benefit from ordinary classroom instruction but would need special educational provision. Intelligence tests started out as reliable predictors of performance in school and remain that to this day. Sternberg has always recognised this limitation of the original tests and their later derivatives and so his theories stress the importance of conceptions of intelligence that are more than measures of “school saviness” and instead relate to life beyond the classroom.

After a brief but comprehensive summary of the major traditions in intelligence theory, Sternberg and his co-authors devote the remainder of the book to their own theory of and research into intelligence “beyond the classroom.” Sternberg’s theorising and research have centred on three aspects of human performance: first, mental components; second, performance of real world tasks, especially as this relates to handling novelty and achieving automaticity of performance, and third, the individual’s capacity to adapt to, shape, or select environments. The theory also goes beyond emphasis on the individual person and explores the contribution of culture to intelligent performance, via exploring which aspects of intelligence are universal and which aspects are culturally relative.

The book, however, does not merely explicate the theory but features chapters on key components of the theory that include information on how to use this knowledge to make one’s own behaviour more intelligent; how, for instance, to improve meta-cognitive aspects of decision-making, such as problem definition, strategy selection, and performance monitoring to improve the quality of one's
daily life. Sternberg’s inclusion of these sorts of examples and the related practice problems has always made his writing on intelligence particularly engaging. Certainly doing the exercises leads to the definite sensation of “getting smarter,” something that can not always be said of wading through the average psychology text! And the discernible improvement in problem solving also provides powerful support for the fluidity of intelligence, that is, the validity of process models of human capacity.

For those schooled in Vygotskyian models of human cognition, Sternberg’s theory does not go far enough in acknowledging the role of culture in the development of the human mind. “Aspects” of intelligence such as discussed by Sternberg can be conceptualised as being the mental tools/processes that form a central part of Vygotsky’s theory.

Vygotsky proposed that the higher mental functions, for example focused attention, develop out of the biologically based lower or elementary mental functions. The process of development is shaped via what Rogoff (1990) refers to as “apprenticeships in thinking,” that is, via learners’ participation in interactions with more experienced and knowledgeable members of one’s culture, which result in the learner’s internalising the culture’s mental toolkit. The end products of this apprenticeship are inevitably cultural in character, rather than biological, universal, and invariant. Work by Rogoff (2003) and her collaborators has demonstrated that mental functions such as attention, which seem universal in structure and function—and are portrayed as such by cognitive processing models—vary in form and function between cultures.

Referring, as Sternberg does, to components of intelligence, could be seen to regress to the cultural tendency to resort to entities to explain human behaviour, where processes might be a better, more flexible, and inclusive model. Language, regrettably, becomes a prison when we try to deal with the very abstract, the “matter” of mind included.

One small criticism I could make arises from the nature of textbooks generally. Those who write them are constrained by the necessity to mention everything relevant to the topic being covered and to assume a stance of fairness or impartiality towards all sides of the inevitable conflicts or debates. Sternberg and his coauthors avoid some of the worst excesses, for example in their coverage of the immensely popular theories of Howard Gardner. The theories are well-summarised and the important observation not omitted from discussion of them that there is little evidence for the existence of the modular structure of the brain predicted by the theory.

Getting the materialist monkey off one’s back proves a little harder, however. It is simultaneously absolutely and undeniably true and profoundly contentious that the brain forms the substrate for human mentality. Absolutely true because without a brain there is no mental activity and the substrates of that activity can increasingly be located and identified. However, what is contentious is whether the characteristics of the neurological substrate are the cause or the correlates of mental activity, that is, on the basis of the current evidence it is possible to argue that learning, experience and practice shape the brain at least as much as they are shaped by it (Heilman, 2002).

From my perspective, Sternberg, Kaufman and Grigorenko give maybe more credit to biological theories of intelligence than the evidence warrants. As an example, they cite without comment Matarazzo’s assertion that clinically useful psycho-physiological measures of intelligence will be available “very soon.” The prediction was, however, made in 1992 and 16 years is a long time in psychology: many major advances in other areas of physiological research have been made in the interim. Similarly, work reported on metabolic efficiency theories dates to the early 1990s and failure to find more recent research in the area would suggest that too was a theoretical dead end.

Another important piece of evidence against materialist models of intelligence not covered in depth by the book is the failure to find the “gene for” intelligence, despite the mapping of the human genome. Careful searching has found a large number of genes that all appear to contribute a very small part of the variance in individual IQ. Given our passion for entities, especially the ultimate entity of the gene, the search will undoubtedly continue in the face of these—discouraging or encouraging depending on one’s perspective—results.

Criticism of Sternberg, Kaufman and Grigorenko’s book is in one sense too easy, given the breadth of its coverage. It remains a very worthwhile addition to the armory of those who seek to educate their students properly—as opposed to letting platitudes and clichés do the talking—about the concept of intelligence, its history and the applicability to daily life of many of the research findings it has generated.

References


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