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Celebrating a Successful and Practical Contribution to the Theory of Intelligence: An Essay Review

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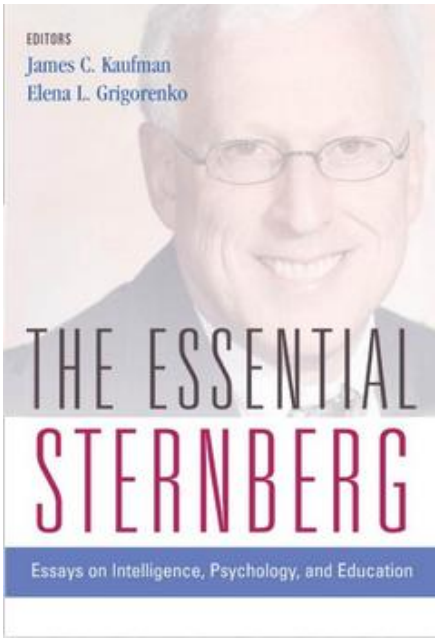
"The time has come to move beyond conventional theories of intelligence."
(Sternberg, 2009k, p. 94)

MODELLING "INTELLIGENCE"

The Essential Sternberg is an anthology of writing by Robert J. Sternberg. Sternberg deserves to be widely read by teachers and others working in education because of his

significant contributions to educational psychology. In particular Sternberg is one of two thinkers who have done so much to open-up the notion of intelligence within educational discourse. Sternberg (along with Howard Gardener) has brought about a situation where most teachers and others educational professionals question the notion of intelligence being something that can be measured in a straightforward way by a test. In this, Sternberg and Gardner have done a great service to education. This claim has to be seen against a context of two rather different uses of the term 'intelligence' that have had rather wide currency for many years. These might be labeled a folk concept of intelligence and a psychometric model.



The Psychometric Model of Intelligence

The psychometric model of intelligence treats intelligence as a construct that has an objective referent: as something capable of ready definition and measurement. The most obvious example of this is in the IQ test that measures 'intelligence quotient' (IQ). To measure IQ, it is necessary to produce an operational definition of intelligence; and to develop a widely agreed methodology for measuring this construct; and then to produce reliable measuring instruments.

This is a scientific process: it is possible to examine the definition of intelligence used, and to critique the validity of the methodology, and the reliability of the instrumentation. Of course, it goes without saying, that in these terms it would be quite possible (in principle, at least) to produce valid methodology and instrumentation for *a particular* definition of intelligence: but the results are only of value to someone who accepts *that* definition. This is at the core of many arguments about IQ testing, and indeed in discussions of whether what is measured in intelligence tests – I will call this Psychometric Intelligence – is largely based on a single factor (e.g. 'g'); or has two components (e.g. crystallised and fluid intelligence); or is a complex of many factors. Where tests are designed according to certain assumptions (as they inevitably must be), those assumptions constrain how revealing the analysis of the test results can be. Such measurements are inevitably theory-laden, even when that theory may not be transparent to users of the instrumentation.

The reputation of IQ in some circles is not helped by the ways that IQ testing has been associated with some of science's more shameful episodes (Gould, 1992). Something that was originally conceived in a socially minded way (as a means of identifying students who could not cope in schools classes with their same age peers, and needed special attention) has been used as the basis for socially divisive categorisations (such as IQ ranges to distinguish 'idiots', 'imbeciles' and 'morons') and behaviour (for example justifying forced sterilization, and claims of the inherent inferiority of some 'racial' groups).

Folk Concepts in The Sciences

I referred to the other notion of intelligence as a 'folk' concept, and that needs to be explained. Modern science has studied the natural world to find patterns and order among natural phenomena. As part of this process, scientists - and here I would include *inter alia* both psychologists and educational scientists (NRC, 2002) - formalise concepts that they use to describe and explain the world. To the layman it might seem that these concepts are offered by nature, but in reality they are always human constructions formed as we attempt to make sense of nature. For example, the Greek philosophers talked of 'elements', and modern science has refined this concept so that it has a somewhat different meaning. The modern notion of 'element' is well defined, and consists of over a hundred different examples: which no longer include earth, water, air, fire or a quintessence. In this case, it seems clear that the concept describes something of the order inherent in nature. However, another concept from chemistry, 'acids' is less obviously a reflection of a natural category. The way acid is defined, and the examples that fit the category have changed over time as chemists have *changed their minds about the most useful* ways to define the term. During these changes, actual substances have not changed their behaviour, but rather those same properties have come to relate differently to the changing definition of the term. At the same time, the words 'element' and 'acid' (among many others having technical definitions in science) have continued to be used by lay people – without necessarily following the technical shifts.

So water and air are still sometimes referred to as elements, rather than (as a chemist would insist) as a compound and a mixture. In the 'life-world' (Jegede & Aikenhead, 1999), air and water may commonly be seen in some sense fundamental and essential materials, and so deserving the tag 'element' in ways that chemical elements such as boron, gadolinium or tantalum may not seem to merit. In the second example, people generally have a notion of what is meant by something being an acid. This notion is usually quite vague, and only has limited overlap with the technical sense: but the term,

and the associated concept, continues to have a role in individual thinking, and perhaps more significantly, in everyday communication.

These examples come from chemistry, but similar things are found in other sciences. Things that are said to be 'energetic' or have 'momentum' in everyday life only share some characteristics with 'energy' and 'momentum' in physics. The physicists may suggest that the layperson is using terms such as energy and momentum in a metaphorical sense – but this is not really correct. Rather there is a folk notion of 'energy' that is a useful concept for thinking and communicating in everyday life, without being equivalent to the physics concept with the same label (Solomon, 1992). The same general phenomenon is found in biology. Around the world people have developed folk taxonomies - which often share *similarities* with biological classifications, without quite being the same (Medin & Scott, 1999). The folk classifications are usually less precise and lack the same level of formal characterisation. However, they continue to exist because they do a useful job in everyday life. If this seems a little abstract, consider the example of trees. 'Tree' is not a significant biological category (Reeb, 1997). What we call trees are actually some of the members of more than one major division of the plant kingdom. Yet despite there being no clear scientific concept of tree in formal biology, most people 'know' what a tree is, and find the tree concept a useful one for talking about…well, trees. So although 'tree' is dubious as a technical term, it is a *bona fide* category term in everyday life.

The Folk Notion of Intelligence

The folk notion of intelligence is somewhat like the folk notion of trees. In everyday life, we talk about intelligence, people being intelligent, intelligent behaviour, and so forth, without this necessarily relating closely to what (most) psychologists have defined as intelligence. In educational contexts, teachers talk to one another, to parents, and sometimes to pupils, about 'intelligence', 'intelligent behaviour', 'more or less intelligent pupils', 'behaving intelligently', and so forth. Parents also initiate conversations about intelligence, for example making a case that their child is intelligent, claiming they could have achieved more at school if they had been more intelligent, or perhaps warning the teacher their Billy does not seem to be as intelligent as his older sister. In all such exchanges, conversation is likely to seem unimpaired by considerations of any lack of technical definition of intelligence. Rather a widely accepted, somewhat vague, notion of intelligence is used that may sometimes be synonymous with 'bright' or 'clever', and which may variously mean knowing a lot, being an effective problem-solver, having a extensive vocabulary, being good at sums,

being a 'quick' learner, and so forth. Despite this ambiguity, people find such folk notions 'fit for purpose' in everyday communication.

The great value of folk notions is that they have evolved - presumably by a form of selection (cf. Blackmore, 2000) - to facilitate effective social conversation: we all 'know what intelligence means': even if - actually - few of us are able to offer a precise definition; and if we might generally have trouble agreeing on exactly how we might demarcate it. We generally recognise it, and (in practice this is good enough because) we largely agree on such categorisations.

This is all very well, but of course *teachers* are educational *professionals*, and 'intelligence' is often considered to be linked to success in school (at least in 'academic' subjects), and intelligence testing is used for selection purposes both within education and in employment.

Yet there is nothing about becoming a professional which makes a person automatically immune from familiar lay notions (and their insidious effect of making us feel we already understand a concept). So despite teacher education, many teachers continue to undertake their professional work based on a folk-theory of teaching, for example, which understands teaching as a process of transferring knowledge into students' minds (Taber, 2009). So although teachers learn about 'constructivist' theories of knowledge and learning based upon well-developed psychological models, their prior understanding of the teacher's role (probably initiated when they were themselves school pupils, and were exposed to hundreds of hours of teachers seeming to behave as if they were attempting to transfer knowledge into pupils' mind) still strongly influences teachers' professional behaviour in the classroom.

There is surely something of a problem here – teachers and the general public think they know what intelligence is, and measures of intelligence are used to make major decisions about the lives of people: but the psychometric intelligence of the testing regimes may be rather different (or at best an aspect of) what teachers, their pupils, and the lay population think intelligence is.

It seems there is a great need for both more clarity about the concept of intelligence, and - certainly within education - much greater awareness of the debates about the issue. The present book is therefore a very welcome offering from someone who is a genuine expert in the topic. The tension between (a) defining intelligence as something objective that can in principle be measured and (b) trying to produce indicators of what most people are referring to when they vaguely talk of intelligence, certainly does not

disappear in Sternberg's writing. Indeed, in a number of the Chapters I sensed some ambiguity in how Sternberg views his own ideas in these contrasting terms. Yet in opening up the nature of the topic (so that such potential ambiguities can be recognised), Sternberg has made an important contribution to readers working in education.

THE ANTHOLOGY

'The Essential Sternberg' offers an excellent range of material to inform those with more than a casual interest in the notion of intelligence. The book will certainly be of much interest to students in psychology (and the broader behavioral and cognitive sciences), as well as being highly relevant to those working in education. The latter would certainly include teachers, but one might hope would also extend to others such as policy makers and curriculum planners.

The book contains 20 chapters previously published in various periodicals; the majority of which are single authored by Sternberg. The material in the final section of the book, 'Robert J Sternberg on psychology: brief insights', includes some fairly light reading material, but perhaps gives the greatest insight into Sternberg as an individual, as well as of the nature of the work of a professional academic. The five preceding sections, however, offer an account of the development and application of Sternberg's most noted area of work, about 'successful intelligence'. Sternberg describes how "one is successfully intelligent to the extent that one effectively adapts to, shapes, and selects environments, as appropriate" (Sternberg, 2009i, p. 184).

Sternberg's Triarchic Model of Intelligence

Much of the anthology concerns the development, testing and application of Sternberg's model of intelligence, known as both the '*triarchic*' theory, and the theory of '*successful intelligence*'. The terms are used somewhat interchangeably in the different chapters of the book, and both terms will be used in this review.
Sternberg explains that the term 'triarchic' derives from how "the theory of successful intelligence comprises three subtheories", which are (Sternberg, 2009m, p. 390):

- a componential subtheory (dealing with the components of intelligence);
- an experiential subtheory (dealing with the importance of coping with relative novelty and of automization of information processing); and
- a contextual subtheory (dealing with the processes of adaptation, shaping and selection).

In Sternberg's model, the cognitive processes underlying intelligence are themselves considered to be of three main types (Sternberg, 2009m, pp. 389-390):

- *Metacomponents*, or executive processes: that plan what to do, monitor things as they are being done, and evaluate things after they are done;
- *Performance* components: that execute the instructions;
- *Knowledge-acquisition* components: that are used to learn how to solve problems or simply to acquire declarative knowledge in the first place.

However, the most salient 'triad' in Sternberg's theory of intelligence is how it comprises of three main aspects he refers to as analytical, creative, and practical; each of which links to a particular thinking style:

> "In terms of the triarchic theory…, wisdom derives primarily from practical intelligence, traditional intelligence primarily from analytical intelligence, and creativity primarily from creative intelligence. The three aspects of intelligence are statistically quite distinct…In terms of the theory of mental self-government …, wisdom draws primarily on a judicial (judgmental, evaluative) style, traditional intelligence primarily on an executive (implementing, executing) style, and creativity primarily on a legislative (inventive, rebellious) style."
>
> (Sternberg, 2009a, p. 371)

Sternberg and his team have developed instruments to test out their ideas, and argue that these support their view that they are tapping into somewhat independent aspects of intelligence. So the Steinberg Triarchic Abilities Test (STAT) :

> "…comprised 12 subtests in all. There were four subtests each measuring analytical, creative, and practical abilities. For each type of ability, there were three multiple-choice tests and one essay test. The multiple-choice tests in turn, involved, respectively, verbal, quantitative, and figural content."
>
> (Sternberg, 2009m, p. 397)

Sternberg reports that "confirmatory factor analysis on the data was supportive of the triarchic theory of human intelligence, yielding separate and uncorrelated analytical, creative, and practical factors" (Sternberg, 2009m, p. 398).

It is this work, including the development of aspects of it to explore issues such as creativity and wisdom, which provides the basis for most of the material in the current volume.

A THEORY OF "SUCCESSFUL INTELLIGENCE"

The first section is set up as an 'introduction to the theory of Successful Intelligence'. This section begins with Sternberg's 'Sketch of a componential subtheory of intelligence' (originally a 1980 paper published in the journal *Behavioral and Brain Sciences*), where he sets out 12 general findings from intelligence research which he considered "about as solid as any phenomena reported in the literature" (Sternberg, 2009h, p. 19). Whilst this summary starts with an acknowledgement of a factor of general intelligence, it also raises a number of themes to be explored in Sternberg's later work, such as the relationship between intelligence and creativity, and cultural influences on understanding of intelligence.

The second chapter (originally a 1984 paper, also from *Behavioral and Brain Sciences*) offers a move 'towards a triarchic theory of human intelligence'. In part this model can be seen to be motivated by Sternberg's belief that "there is a need to generate some external standard that goes beyond the view, often subtly hidden, that intelligence is what IQ tests happen to measure" (Sternberg, 2009l, p. 35), and his conviction that "it does not make sense to impose one culture's tests on another culture, no matter how fair the test may be for the first culture, unless the adaptive requirements of the two cultures are essentially the same" (p. 43). Sternberg's triarchic model was built on three sub-theories (a) relating intelligence to the individual's actual environmental context; (b) considering the need to distinguish between dealing with novelty and learning to automate behaviour in terms of routines for responding to familiar 'problem' contexts; (c) linking intelligence to the information processing tasks that are needed to support the mental mechanisms seen as part of intelligent behaviour. Even at this stage in Sternberg's work, there is a clear shift in focus from standardized paper-and-pencil testing, to conceptualising intelligence in more practical everyday contexts.

This leads to the final chapter in this section of the book, Sternberg's 1999 paper (from the journal *Review of General Psychology*) offering 'the theory of successful intelligence'. Here the reader is invited "to move beyond conventional theories of intelligence" (Sternberg, 2009k, p. 94). Sternberg offers instead a notion of successful intelligence, or "the ability to achieve success in life according to one's personal standards within one's sociocultural context" (p. 77), and encompassing analytical, creative and practical skills. It is tempting to argue that by this point Sternberg had already achieved a great deal in terms of questioning the *status quo*, and offering directions for progress in thinking about intelligence.

STERNBERG ON CREATIVITY

Section 2 of the anthology explores 'components of successful intelligence: creativity, practical intelligence, and analytical reasoning'. The section comprises of three papers, one linked to each of the three components of Sternberg's model of successful intelligence.

The first of the chapters in this section is a recent contribution (published in 2006 in the *Creativity Research Journal*), on a currently vogue area in education, creativity (Sternberg, 2009j). In this single-authored paper, Sternberg discusses the approach to creativity taken within his research group: an approach that is framed within his triarchic theory of intelligence. This chapter discusses the results of a number of relevant studies that Sternberg and his colleagues have undertaken.

A number of key points are highlighted in the chapter. Sternberg considers his approach to creativity to be a 'confluence' approach, which he contrasts with the 'psychometric' approach taken by earlier pioneers. (This of course reflects my observation above, about Sternberg's work moving an understanding of intelligence in education away from the psychometric model.) Sternberg's model of creativity is referred to as the 'Investment' theory, which he explains with the metaphor of a creative person needing to 'buy low and sell high', i.e. buying into an unpopular idea that has potential to be developed and then 'sold' to others in the field. The investment model identifies six categories of resources that are needed for creativity: intellectual skills; knowledge; thinking styles; personality; motivation; environment. These resources are not combined in a simple additive sense, Sternberg argues, but rather there needs to be a 'confluence' of these factors: that is they operate, to some extent, synergistically.

The latter resource category (environment) is, unlike the others, external to the individual: reminding us once again that it is senseless to make judgements of creativity (or intelligence) in an intellectual vacuum: that rather such notions only become meaningful within a particular environment. That said, Sternberg' model is enabling: given the motivation to make a difference, a truly creative person's thinking skills and knowledge base can indicate how best to be creative within *their* environment. Of course, there are limits here – there are certainly more or less favourable circumstances that allow us to make the most of our skills – but a person highly resourced in terms of intellectual skills, knowledge, thinking styles, personality and motivation has the potential to demonstrate creativity as an academic, as a elementary school teacher, as a corporate middle manager, as a sports coach and so forth.

Indeed this links closely to two other key points Sternberg makes in this chapter, relating to choice and to social equity, to which I turn in a moment. It also links strongly to an area of Sternberg's work which is not, directly at least, well-represented in this anthology, relating to giftedness. Like Gardner (1998), Sternberg recognises that creativity needs to be *demonstrated to those who will recognise it* as such. In his 'pentagonal implicit theory of giftedness', demonstrability was one of his five *necessary* criteria of giftedness (Sternberg, 1993).

One key feature of Sternberg's notion of creativity, is that it is to some extent a matter of personal *choice*: that it is a personal decision about how we stand in relation to the world. We can choose to keep our heads down, to go with the flow, not to rock the boat (or whatever metaphor is preferred), but that is not the root to creativity. Being creative means making a stand for something that is not as of yet widely recognised as good, valuable, sensible etc. 'Buying low' means taking the route less travelled; and 'selling high' is not about waiting for the market to shift, but rather about persuading others that there is value in the intellectual commodity you offer. Moreover, Sternberg suggests that we are all born with the potential to make these choices, but mostly learn not to be too creative:

> "Creativity is as much a decision about and an attitude toward life as it is a matter of ability. Creativity is often obvious in young children but it may be harder to find in older children and adults because their creative potential has been suppressed by a society that encourages intellectual conformity."
>
> (Sternberg, 2009j, p. 112)

This raises the question of why some pass through this process without losing the imperative to be creative: and presumably this is down to both character traits that are at least partly under genetic influence, and to upbringing - the extent to which home and educational backgrounds were supportive of individuality and novelty rather than valuating conformity. No doubt the choice to be creative is like all human choices: both constrained and channeled; and like all human choices it has a price. Sternberg does not explore such issues in any detail here, but nor does he imply this would be a totally 'free' choice (and this is something he does touch upon a little more in a later chapter Sternberg, 2009f). Sternberg does however present creativity as something we can all, in principle, decide to nurture in our own intellectual lives – as long as we are prepared to spend some time standing alone and arguing for our ideas.

Humanistic psychology might suggest that the extent to which individuals will feel able to take such a stance, may depend upon the degree to which they have been supported to become 'self-actualized' (Maslow, 1943), which would imply that educational experiences may be important in facilitating the growth of personalities that would not find such choices threatening.

This links to one of Sternberg's other key points made in this Chapter. This relates to the nature of the educational system, and what we might suggest are inherent biases. From a perspective on intelligence as comprising abilities in analytical, creative and practical domains, Sternberg argues that schooling is largely weighted towards developing and valuing the analytical aspects, to the detriment of other aspects of intelligence:

> "Children with creative or practical abilities, who are almost never taught or assessed in a way that matches their pattern of abilities, may be at a disadvantage in course after course, yeah after year."
>
> (Sternberg, 2009j, p. 113)

Again there are parallels here with Gardner's (1993) work, where he argues that traditional education focuses disproportionately on a sub-set of the multiple intelligences that people have (in his scheme, those intelligences concerned with linguistic and logico-mathematical competences).

However, not only does Sternberg suggest that traditional forms of education are unbalanced, but his work suggests this very bias may contribute to perceptions of group differences between those from different cultural backgrounds. So in one project, where students were assessed according to their strengths in the three areas of the triarchic model of intelligence, Sternberg and his collaborators observed how

> "the students in the high creative and the high practical groups were much more diverse in terms of racial, ethnic, socioeconomic, and educational backgrounds than were the students in the high analytical group…"
>
> (Sternberg, 2009j, p. 112)

So it appears, according to Sternberg's work, that conventional education:

- has an uneven focus in terms of the main components of intelligence; and enacts this bias in such a way to:
    - suppress creativity in children;
    - undervalue the intelligence of those with strengths in creative and practical intelligence; and

- exaggerate the difference in typical intelligence between those from advantaged 'majority' backgrounds, and those from minority and/or disadvantaged backgrounds.

Taken together, this amounts to a rather significant critique of what I refer to earlier as psychometric intelligence.

Sternberg clearly argues for teaching that is better able to nurture a balance in developing intelligence. He is also able to point to one of his studies which suggested that teaching designed to engage creative and practical intelligence is not only better able to support learners in these regards, but is also just as effective in meeting more traditional learning objectives. That is, that "to the extent that one's goal is just to maximize children's memory for information, teaching for creative and practical thinking is still superior" (Sternberg, 2009j, p. 113).

The chapter concludes with Sternberg's typology of 'Types of creativity that accept current paradigms and attempt to extend them'. However, whilst this contribution is of interest, it is the earlier themes in the chapter that are likely to be of most interest to teachers and others working in education. If Sternberg is right, then there is a major need to rethink much of conventional curriculum and pedagogy: for doing so should lead to a considerable improvement in the way that schooling can help develop students' intelligences.

Practical Intelligence and Tacit Knowledge

The other two chapters in this section of the book are somewhat more technical, and will perhaps be less central reading for many educational professionals. The second chapter in this part of the book is a coauthored 2006 journal paper (from *Learning and Individual Differences*) about measurement of practical intelligence and tacit knowledge (Cianciolo et al., 2009). This paper reports studies which are used to argue that practical intelligence cannot be understood as equivalent to fluid and crystallized intelligence, nor general intelligence (despite overlapping with these constructs), and so may be seen as important in the context of Sternberg's research programme.

Tacit knowledge refers to that knowledge we develop which we apply without being explicitly aware of holding it. Polanyi (1962) highlighted the role of tacit knowledge in scientific work. By its nature, tacit knowledge is difficult to specify: "discovery must be arrived at by the tacit powers of the mind and its content, so far as it is indeterminate, can only be tacitly known" (Polanyi, 1970: 220). However, much of our knowledge is of this type. Indeed, some theorists have argued that our explicit knowledge is only meaningful (cf. rote learning, Ausubel, 2000) by virtue of having been either

generalised from, or at least linked to, more implicit forms of knowledge (Vygotsky, 1934/1986; Karmiloff-Smith, 1994).

Sternberg suggests in this volume that "an example of tacit knowledge would be knowing that if teachers are asked to do too many new things to improve their teaching, they may become confused and teach less rather than more effectively" (Sternberg, 2009m, p. 394). However, for many working in education, this would not considered tacit knowledge, but rather part of the explicit public knowledge supported by research and scholarship into areas such as teacher development and school leadership. So what is tacit knowledge for some individuals may be quite explicit for others. In any case, the very act of offering a verbal description of such knowledge immediately represents it in a form which makes it appear *unlike* tacit knowledge: when acting on tacit knowledge we may be able to rationalise the decision later (and perhaps in a way which reasonably reflects the knowledge applied), but by definition we do not consciously reason in that way at the time.

In this chapter it is argued that tacit knowledge is a manifest indicator of practical intelligence. The chapter describes studies using 'tacit knowledge inventories', and the factor analyses carried out on the data collected.

Thinking with Analogies

The final chapter in this section is a 1977 paper of Sternberg's (from the Journal *Psychological Review*), concerning analogical thinking. Analogical thought is highly important in reasoning: as Sternberg suggests "we reason analogically whenever we make a decision about something new in our experience by drawing a parallel to something old" (Sternberg, 2009c, p. 145). In a sense, of course, 'something new' is what we experience every moment of our lives. When I get home from work of an evening I reach for the key that unlocked the front door on previous occasions, without consciously considering that I am making an analogy between my current situation and previous times when I have faced the same locked door. It could be argued that this is not really analogical thinking: that in such a familiar context I automatically adopt a particular 'script' or 'schema'. However, at some level I have to recognise the unique 'now' as sufficiently similar to previous unique moments in my life (I'm at what seems to be the same door, of the same house, with what seems to be the same bunch of keys) despite elements of uniqueness - there was no snow on the path last week, and I've come home on an 'earlier' bus than I often do. ('Earlier' is placed in scare quotes here, because *by definition*, the bus I caught *today* must be later than any bus I've caught on *previous* days. It is only considered 'earlier' by *drawing an*

analogy between different days and considering that they may be understood in terms of a common pattern.)

This chapter describes studies testing out different models of how people solve analogical problems. Sternberg relates the results to the role of analogy-based items in measuring 'general intelligence', arguing that the solution of these types of items taps into various aspects of 'higher order general intelligence'.

APPLYING SUCCESSFUL INTELLIGENCE IN SCHOOL CONTEXTS

The third section of the book, 'Successful intelligence in the Schools', comprises of four chapters on various aspects of applications of Sternberg's theory of Successful Intelligence.

The first of these chapters is a 2003 paper authored by Sternberg, originally published in the journal *Educational and Child Psychology* (Sternberg, 2009i). This is a fairly brief, and very readable (non-technical) argument for teaching according to the successful intelligence model. The flavour of the writing is clear from the 'abstract', which claims that

> "Our goal is to raise the achievement of all students by teaching them in a way that matches the way they learn. The question, of course, is how to do it. We think we have a way. Of course, it is not the only way. But, so far, it seems to work for a wide variety of students of varied ages and in diverse subject-matter areas."
>
> (Sternberg, 2009i, p. 183)

Sternberg outlines studies which have tested the successful intelligence approach in the classroom, and concludes that "the common element of all these studies is the possibility that when students are taught for successful intelligence, they are better able to capitalize on their strengths and to correct or compensate for their weaknesses, so they learn at higher levels" (Sternberg, 2009i, p. 191).

In this chapter, Sternberg considers how his theory compares with two others that are likely to be familiar to teachers: those of Bloom and Gardner. Sternberg suggests that his theory and Gardner's theory of multiple intelligences are 'largely complementary', and this is certainly the case in the sense that Sternberg's theory is intended to apply across domains. Sternberg suggests his own theory has been better tested. He also suggests that "in order to survive in the world, everyone has to have at least some

ability to think analytically, creatively and practically" whereas "it is not clear that, *in order to survive* in the world, everyone has to think musically" (p. 190, *emphasis* added).

Whilst this latter point may be technically correct, it has the air of something of a 'cheap shot'. For one thing, musical intelligence (if for the sake of argument one accepts Gardner's construct) can certainly contribute to 'effectively adapt[ing] to, shap[ing], and select[ing] environments" (p. 184), and so by Sternberg's criteria would seem to have potential to contribute to being successfully intelligent in many contexts. Moreover, education is about helping people reach their full potential, and music is an important part of being fully human for a great many people. In terms of Maslow's 'hierarchy of needs' (Koltko-Rivera, 2006; Maslow, 1943), Sternberg is here limiting his attention to the base of lower needs, and ignoring the higher needs that make us fully human nearer the apex of experience. Gardner's theory seems in this sense more in tune with the aims of what is sometimes called a liberal education (where Sternberg seems more concerned with pragmatics). If we accept Sternberg's suggestion that his and Gardner's ideas are complementary, then Gardner's theory reminds us that we need to exercise successful intelligence in the inter- and intra-personal domains if we wish to be happy survivors and not just 'to survive'. It was Sternberg who argued that "by expanding the range of developing expertise that we measure, we discover than many children not now identified as able have, in fact, developed important kinds of expertise" (Sternberg et al., 2000: 9-10), and this seems very much the tenor of Gardner's theory of multiple intelligences.

In considering Bloom's taxonomy of educational objectives in the cognitive domain (Bloom, 1968), Sternberg points out that this is not intended to be a theory of intelligence, and this is quite right. However, Sternberg recognises that Bloom's ideas are well known and likely to be applied by some teachers. Indeed, it might be argued that for teachers seeking to develop pupils' analytical, creative and practical intelligence, a typology that can help teachers plan teaching and assessment to include tasks requiring evaluation, synthesis and application (Anderson & Krathwohl, 2001) can only a useful aid. Indeed, as with Gardner's ideas, the Bloom taxonomy would seem to be a useful component to complement Sternberg's theory in a teacher's professional mental toolkit. Sternberg acknowledges that "effective teachers will not 'totally buy' into any one theory. Rather, they will select those techniques from each theory that work most effectively for them in their teaching" (Sternberg, 2009i, p. 190), and his main argument is that teaching is largely atheoretical, and any systematic adoption of a theory supported by data should be welcomed.

Following the pattern of the previous section of the book, a paper accessible to a general audience is followed by more technical contributions, which report particular studies in more depth.

The second chapter in this section is coauthored paper originally published in 1998 (in the *Journal of Educational Psychology*) which details studies testing 'teaching triarchically' in two school contexts (Sternberg, Toff, & Grigorenko, 2009). One study was carried out in two primary (elementary) schools, and the other was undertaken at a Summer school introducing psychology to gifted middle school students. Whilst acknowledging important provisos about necessary methodological limitations, the authors conclude from these studies that "students benefit from triarchic instruction" even when "it is given in equal fashion to all students" (p. 213).

This is an important claim, for teaching that requires teachers to identify different individual students' strengths and develop a programme that allows different students to learn in different ways is a lot more difficult to set up than teaching which offers variety for all across activities and lessons. Perhaps in an ideal world, each student would have an individualised learning programme, but in that ideal world teachers would not be expected to prepare 20 plus hours a week of teaching for classes of several dozen different students each. Whilst offering some degree of choice to students is certainly to be encouraged for all sort of reasons (to support student autonomy and developing self-regulation, to make work relevant to individual's interests etc), and may be highly motivating for students (Taber, 2007), most classroom teachers need to structure their lessons around a common central lesson plan with a balance of teacher-led and individual/group work.

In the UK there has been a strong interest in notion of meeting students' learning styles. However, many of the wide range of available models have little empirical support (Coffield, Moseley, Hall, & Ecclestone, 2004). Many schools have been 'sold' a popular approach based on notions of students being primarily visual, auditory or kinesthetic learners. This seems fairly harmless when it encourages teachers to present information multi-modally, so that all students experience learning reinforced through the different senses. However, it is not unheard of for students in some schools adopting these ideas to start claiming that they are 'visual learners' on the basis of a simplistic self-administered questionnaire, and using this as a justification for not being expected to learn through other modalities.

The next chapter in this section is another coauthored paper, this one having first been published in 1999 in the *European Journal of Psychological Assessment* (Sternberg,

Grigorenko, Ferrari, & Clinkenbeard, 2009), and discussing a study where different groups of students were taught primarily in terms of the different components of Sternberg's triarchic model of intelligence (one of the studies briefly discussed in the first chapter in this section of the book).

The context of the study was a Summer programme for gifted 14-18 year olds at Yale (so somewhat removed from a mainstream 'school' context). The students were assessed according to Sternberg's triarchic model of successful intelligence, and identified as either being balanced across the three components (at high or lower levels of attainment) or being especially strong in one of the components (as high-analytical, high-creative or high-practical). Students were assigned to different treatments which included instruction particularly biased towards analytical, creative, or practical intelligence, or instruction aimed primarily at producing recall. The paper concludes that "students performed better when they were better rather than poorly matched in instruction vis-á-vis their triarchic pattern of abilities" (p. 229). This finding should be compared against the conclusion of the preceding chapter: students learn most effectively if instruction matches their strongest intelligence component (on Sternberg's model): but teaching that is designed to rotate across these components is still more effective than 'traditional instruction' "of the kind that millions of students in the United States and elsewhere receive every day" (Sternberg, Toff et al., 2009: 214).

The final, and perhaps the most specialised and technical, chapter in this section is a paper that first appeared in the journal *Contemporary Educational Psychology* as recently as 2006 (Stemler, Grigorenko, Jarvin, & Sternberg, 2009). Sternberg is listed as the last of four co-authors on this paper, although like many of the other contributions in the volume it is strongly focused on the triarchic / successful intelligence model. The chapter describes a study to apply the theory in the context of the 'Advanced Placement' (AP) programme, which provides opportunities for US high school students to study for college credit whilst still at school. The chapter describes a study with two major components: firstly to demonstrate that valid high-stakes tests can be designed according to Sternberg's theory of intelligence; then to consider how students perform on the new 'augmented' tests compared with the traditional AP tests.
The first part of the chapter describes the process by which test items were designed, reviewed and built into 'mock' tests for AP students taking the examinations in either psychology or statistics. These mock tests were taken by students (of volunteering teachers) who were also taking the official AP tests so that outcomes could be compared. Some of the background will be very familiar to anyone reading the book in the presented sequence, but teachers reading the chapter would probably find the

discussion (on pp.240-243) of sample items testing different aspects of intelligence (according to the Sternberg model) of interest in thinking about how they could apply the theory in their own classroom teaching and assessment.

Whilst not all readers will be interested in the details of the various statistical techniques discussed (Rasch modelling; cluster analysis), the findings are reported clearly enough for the general reader. One expected finding was that some aspects of the augmented examinations correlated with the standard examinations better than others: "the analytical subscale was correlated most highly with the actual AP [psychology] exam score…whereas the practical subscale was least correlated with the actual AP exam score" (Stemler et al., 2009: 249). For the statistics examinations, "the memory subscale was correlated most highly with the actual AP exam score…whereas the creative subscale was least correlated with the actual AP exam score" although this difference was not found to be significant (p. 250).

When cluster analysis was applied to the augmented examination data in the two subjects, in each case the researchers found "three factors correspond[ing] to three distinct profiles of achievement primarily found in the dataset" (p. 256) – each of which could be expressed in two directions. So for the psychology test, the profiles would be (pp. 256-257):

- students with low (or high) scores on the memory subscale compared with their scores on the analytical, creative or practical subscales;
- students with relatively low (or high) scores on the practical thinking skills subscale, compared with their scores on the memory, analytical and creative subscales;
- students with relatively high (or low) performance on the creative subscale AND relatively low (or high respectively) performance on the analytical subscale compared with the memory and practical subscales.

For the statistics examination (pp.260-261), the clusters represented profiles of

- relatively high (or low) score on the memory subscale, compared with the analytical, creative and practical subscales;
- relatively low (or high) performance on the analytical subscale, but relatively high (or low respectively) performance on the creative subscale;
- relatively low (or high) performance on the analytical subscale compared with a fairly level achievement on the other subscales.

This again suggests that the components of Sternberg's theory are tapping into somewhat different cognitive skills or aptitudes, as well as demonstrating that it is

possible to develop 'high stakes' assessments that can test these different components of intelligence.

The chapter also discusses - albeit with a proviso of the small and potentially unrepresentative nature of the sample of students taking the augmented examinations – how students identifying themselves with different ethnicities seemed to perform differentially on the different components of the augmented examination. So in the psychology examination, for example, a difference between 'White' and 'Black' students of three quarters of a standard deviation on the traditional examination was reduced to one quarter of a standard deviation on the augmented examination. This seemed to relate to there being a 'virtually non-existent' difference in performance on both the memory and creative sub-scales. The difference found varied according to ethnic grouping and the subject (the overall difference between 'Black' and 'White' students was higher on the augmented statistics examination than on the traditional examination), but reinforced the general point that claims that there are ethnic differences in intelligence need to be studied in terms of a more nuanced way than by looking at single measures such as overall IQ scores.

APPLYING THE THEORY TO ADMISSIONS PROCESSES

The fourth section of the book contains two chapters concerned with the selection of candidates for courses.

The first of these is a paper published in the journal *Intelligence* in 2006, authored by Sternberg with 'the Rainbow Project Collaborators' (Sternberg & The Rainbow Project Collaborators, 2009). This paper actually follows on well from the previous chapter (and like it, is a quite technical paper), in that it explores how standard examinations can be 'augmented' by consideration of Sternberg's triarchic theory of successful intelligence. The chapter describes a complex study which tested students on the STAT in tandem with the 'SAT' (formerly known as the Scholastic Aptitude Test or Scholastic Assessment Test) which is widely used as the basis for judging candidates for admission to college programmes in the US. The SAT is "based on a conventional psychometric notion of cognitive skills" and "has substantive success in predicting college performance" (Sternberg & The Rainbow Project Collaborators, 2009: 310), as measured by the grade point averages (GPA) awarded to students.
The study was quite complex, involving 1013 students in their first year of college courses, or final year of high school. The chapter focuses on the findings from 777 students attending college level courses (and excluding some students where data was incomplete or the number of participants from an institution was very small). The

chapter describes and presents the outcomes of much of the analysis (and the reader is told that additional and alternative analyses are available to be downloaded from the web).

The study concludes that for the sample of students "the triarchic measures alone approximately double the predicted amount of variance in college GPA when compared with the SAT alone" and they also "predict an additional 8.9% of college GPA beyond the initial 15.6% contributed by the SAT and high school GPA" (Sternberg & The Rainbow Project Collaborators, 2009: 310). Moreover, the study again claims a 'substantial' reduction in between-ethnicity differences.
The second chapter in this section of the book is another 2006 paper, republished from the journal *Learning and Individual Differences*. This chapter, on which Sternberg is listed as the last of 5 co-authors, moves up to the next academic level to consider graduate business school, and in particular the potential of measures of the 'practical intelligence' component of the triarchic theory in admission decisions (Hedlund, Wilt, Nebel, Ashford, & Sternberg, 2009).

In some ways this study is a natural development of work reported in previous chapters. The context is the limited predictive success of the main measures used when considering applicants for graduate business school, i.e. undergraduate grades and the GMAT (Graduate Management Admissions Test), which is well established in the US, like the SAT used when considering undergraduate admissions. Again, an issue of disparity in test scores between different groups of applicants is raised: in the case of the GMAT, it is not only minority ethnic groups which might seem to be disadvantaged, as females tend to score lower than males as well.

The chapter discusses the development and testing of two alternative instruments that might be used to augment the traditional measures. Whereas other studies in the volume tend to draw on the triarchic model as a whole, the focus here is on developing assessment to tap into the 'practical' component of Sternberg's successful intelligence model, which are considered especially relevant to developing problem-solving skills in a management context. Two such instruments are described, 'case scenario problems' (CSP) and 'situational judgment problems' (SJP). Both instruments are tested in two studies: on successive cohorts of graduate management students.

The studies reported concern testing new students at one graduate school, and then comparing their performance on the new instruments with subsequent measures – in particular course grades after one year and at the completion of the programme. As the authors acknowledge, this is a limited population in that (as well as being in a single

institutional context) only students admitted to the graduate programme were tested rather than the broader range of candidates applying. In general it was found that both the new instruments were able to offer some modest predictive value, and that this was in addition to that already available from the GMAT or previous GPA scores from previous study. The new instruments were indeed considered to be tapping into some qualities of students relevant to later course progress, but not already being accessed in the traditional measures.

There is some interesting detail in the studies. A key finding is that whereas the traditional measures seem to favour male applicants, females tended to outscore males on the new 'practical intelligence' measures. The authors point out that "using our new measures in addition to the GMAT thus helps 'cancel out' the gender differences obtained when only GMAT is used in assessment" (Hedlund et al., 2009: 336).
There was also (as found when using augmented measures in relation to undergraduate admissions in the previous chapter) some reduction in group differences related to students' reported ethnicity. Of particular interest, one such difference that was found of Caucasian students on average outscoring Asian students on the CSP was considerably reduced when corrected for Citizenship (i.e. making the decision not to compare US and non-US citizens on the assumption that non-US citizens were more likely to be non-native English speakers who might well struggle with the language demands of the instruments); whereas the same correction actually increased the differences found for ethnic groups on GMAT scores. This suggests that actual average performance differences by students from different ethnic groups within the US may be somewhat masked by overseas applicants from ethnic minorities: whereas the practical intelligence tasks provide more 'even ground' for considering applicants from different groups.

The authors actually question at one point in the Chapter whether the use of US experts as advisors in developing their instrumentation may have introduced a cultural bias into the way different problem responses were judged in the new measures. This once again reminds the reader how important it is not to lose sight of the cultural context of assessments, even when what is being measured is supposedly as general as 'practical intelligence'. It could also be argued that when international students deliberately choose to apply to US Graduate schools, it may well be in part because they value US ways of thinking about management. In this context the definition of practical intelligence as "the ability that individuals use to find a more optimal fit between themselves and the demands of the environment through adapting to the environment, shaping (or changing) the environment, or selecting a new environment in the pursuit of personally valued goals" (p. 323) has a particular resonance.

Interestingly, the second study, a 'replication', produced similar results to the first, but with differences in the significance levels of findings. So, for example, the higher mean performance of female students on the SJP was not repeated: although the difference was still found with the CSP. The authors suggest this might in part relate to the slightly different organisational details for collecting the data (the conditions under which the CSP and SJP were taken by students), reminding the reader of the problematic nature of 'replication' in the human and social sciences.

CONSIDERING WISDOM, LEADERSHIP, AND THE "COMMON GOOD"

The fourth section of the book, 'Successful intelligence, leadership and wisdom' consists of two chapters related to the notion of *wisdom*. The first of these is something of a position paper by Sternberg presenting his 'balance' theory of wisdom (Sternberg, 2009a). This was originally published in 1998 in the journal *Review of General Psychology*. In this paper Sternberg outlines key previous psychological writing about the notion of wisdom, before presenting his own theory.

As one might expect, Sternberg's notions link to his broader triarchic theory of intelligence, and in particular that wisdom is primarily about the practical intelligence component of successful intelligence, rather than analytical or creative intelligence. Sternberg argues that the application of wisdom is closely linked to the tacit knowledge available to an individual, i.e. that to be wise one must have a relevant store of tacit knowledge to draw upon. It follows then that wisdom should to some extent be culturally relative, as the tacit knowledge that will be relevant will to some extent be context dependent. The link to tacit knowledge seems feasible (if one accepts that "wisdom is procedural knowledge, it is about what to do in usually difficult and complex circumstances", p.361), but is perhaps one of the more weakly supported aspects of Sternberg's work: it is not entirely clear why a suitable store of explicit knowledge might not serve as well in this regard.

Sternberg suggests that *wisdom* is something other than just a synonym for what he refers to as *practical intelligence*, but rather that it is "a very special case of practical intelligence, one that requires balancing of multiple and often competing interests" (p. 363). Sternberg sees wisdom as an ability to balance a range of considerations, and, in particular, the needs and interests of different people for 'a common good for all relevant stakeholders': "in wisdom, one seeks a common good, realizing that this common good may be better for some that others" (p. 363) and "wisdom is involved when practical intelligence is applied to maximizing not just one's own or someone else's self-interest, but rather a balance of various self-interests (intrapersonal) with the

interests of others (interpersonal) and of other aspects of the context in which one lives (extrapersonal), such as one's city or country or environment or even God" (Sternberg, 2009a, p. 361). Sternberg rightly points out that balancing such considerations depends upon value judgements – without values there is no basis for weighting competing concerns and interests.

> "According to my balance theory of wisdom…wisdom is defined as the application of intelligence, creativity, and knowledge as mediated by values towards the achievement of a common good through a balance among (a) intrapersonal, (b) interpersonal, and (c) extrapersonal interests, over the (a) short- and (b) long-terms, in order to achieve a balance among (a) adoption to existing environments, (b) shaping of existing environments, and (c) selection of new environments."
>
> (Sternberg, 2009m, pp. 414-415)

Sternberg acknowledges that "Some theorists have viewed wisdom in terms of post-formal-operational thinking, thereby viewing wisdom as extending beyond the Piagetian stages of intelligence" (p. 357). Piaget's theory sets out levels of cognitive development that are seen as general purposes resources for cognition across domains, and the kind of fifth stage (Arlin, 1975) - i.e. beyond Piaget's fours stages - of post-formal operations (Kramer, 1983) that has been discussed by some commentators would be expected to apply to contexts where analytical intelligence is needed (e.g. understanding wave-particle duality in physics) as well as in the moral sphere where value judgements are needed. Perry's (1970) work on 'ethical *and* intellectual development' seems highly relevant here, and would seem to apply to both the development of wisdom and higher level conceptual understanding.

To this reader, there was however some tension in Sternberg's construct of wisdom. At one level, it seems to relate to the demonstration of a high level of practical intelligence in particularly complex problem contexts where the individual has appropriate relevant resources to effectively respond to that problem context. Yet, if this were all, then it would be little more than an association with uncommonly high levels of practical intelligence. This might reflect something of Sternberg's work on giftedness (Sternberg, 1993), where it could be argued that the wise person is someone who is able to demonstrate high levels of practical intelligence in problem contexts that others considered sensitive and challenging, by suggesting solutions and responses that are recognised (by those others) as appropriately weighing and responding to the various conflicting considerations. Such an approach would recognise that - as in Gardner's work on the notion of a genius (Gardner, 1998) – any evaluation of wisdom is

necessarily culturally relative. In other words, there is the equivalent of a 'field' in terms of the body of people making the judgement.

The problem here is that Sternberg seems to acknowledge such considerations, whilst also wishing to hold on to the notion of the common good as having some kind of independent objective existence - perhaps in part because this allows him to claim his balanced theory of wisdom is broader than Kohlberg's work a "it applies to any human problem involving a balance of intrapersonal, interpersonal, and extrapersonal interests, regardless of whether moral issues are at stake" (p. 364).
So Sternberg suggests that although 'despots such as Hitler or Stalin' (p. 363) may demonstrate high levels of practical intelligence allowing them to make balanced judgements, they should not be considered wise as their decisions were not made for the public good. That however *is* surely to make a moral judgement: wisdom becomes the application of high levels of practical intelligence in making decisions that *are considered* to be morally appropriate.

I do not suggest that Sternberg is arrogant enough to set himself up as the judge of the 'common good', but he proceeds as though it is something that may be unproblematically recognised. (Although it might worth noting that Sternberg's approach seems to reflect Maslow's idea that "the organism itself dictates hierarchies of values, values which the scientific observer reports rather than creates", Maslow, 1948: 433). Who is to judge whether Hitler's decisions were for the common good? With the benefit of hindsight it may seem ridiculous to even raise this question, and it could perhaps even seem disrespectful to the millions who died at the hands of Nazi genocide, and in the war that Hitler's rise precipitated. Yet it also seems clear that part of the context that allowed something as dreadful as the Holocaust to occur was that for a period of time many of the people in a large democratic state judged that Hitler was able to make difficult decisions that they felt were for the common good. That our judgements now make that seem so inconceivable should warn us of the relative nature of such a notion.

Whilst it might seem distasteful to raise such views, it is surely important not to simply characterise Hitler as a mad egomaniac who somehow took advantage of difficult social, economic and political conditions to hoodwink a nation: any more than the outcome of the 1939-45 World War should be mytholised as the necessary triumph of good over evil (as but for a few major decisions that could easily have been called differently, there might have been a considerably - geographically and temporally - extended Third Reich). Guarding against future similar horrors surely requires careful

understanding of how such things are possible (and human history shows the Nazi were not total outliers in this regard).

The Nazi philosophy, much of which was widely disseminated during Hitler's rise, led to "the belief that the genocide of the Jews was a mission required for the salvation of the world" (Lerner, 1992: 38-39). Sternberg tells us (in the following chapter) that whereas "a person could be practically intelligent and look out only for his or her own interests. A wise person never could look out only for him or herself" (Sternberg, 2009m, p. 417) – but certainly to his followers Hitler was seen to be committed to the higher interest of the good of the Volk. Indeed it has been suggested that "Hitler's campaign to destroy the Jews was, to him, no less than a struggle of innate good versus innate evil, of God versus the devil" (Lerner, 1992: 42). I am sure Sternberg would find such a characterisation as abhorrent as I do, and as - no doubt - the vast majority of his readers would. Yet we have to accept that at a different time and place, Hitler's policies were widely seen to be for the common good.

As with the case of Hitler, Stalin was – in a certain place, and at a certain time – considered by many people to be wise – to have the wisdom to make decisions for the general good of his people: "responsibility for the establishment of the Soviet regime and its consolidation were thus attributed directly to Stalin. All achievements in the building of socialism and, after 1936, the move towards the communist society, were portrayed as stemming directly from Stalin's wise leadership" (Gill, 1980: 169). That this was the 'line' being sold by the party machine does not negate it *to the degree that it was 'bought'* by many in the population.

As Sternberg comments, "practical intelligence in general, and wisdom in particular, seem to apply primarily in the field [rather than within a domain]" (Sternberg, 2009a, p. 366), yet in being transferred from obvious areas of expertise (synthetic chemistry; criticism of renaissance painting; studies of intelligence) to institutional, social, and political contexts, the notion of 'the field' may end up describing something that is much more transient and permeably bounded than is usually understood. In this context, Sternberg's characterisation of his theory of wisdom as an explicit approach (a construction of 'expert theorists and researchers', p.356), rather than an implicit psychological approach (where: "the goal is not to provide a 'psychologically true' account of wisdom, but rather an account that is true with respect to people's beliefs, whether these beliefs are right or wrong" p.354) seems a matter of degree, rather than a definitive classification.

"Educational" Leadership

The second chapter in this section discusses what Sternberg labels 'WICS' or a "model of positive educational leadership comprising wisdom, intelligence and creativity synthesized" (Sternberg, 2009m). This chapter was originally published in 2005 in the journal *Educational Psychology Review*.

The reference to *educational* leadership seems somewhat ambiguous. Sternberg tells us that his model "can be applied to various kinds of leadership" (p. 377) although the paper will be primarily concerned with 'educational leadership'. He goes on to consider models of leadership that could be 'applied to educational settings', suggesting that the focus is on such matters as school leadership. However, at other points in the chapter it seems that Sternberg is concerned with leadership in *any* context which can be *seen as 'educational'* rather than just leadership in formal educational institutions: referring for example to "people who are the positive educational leaders of society" (p. 387). Sternberg asks his readers to "consider the role of a politician in educating his or her citizenry. Stalin was successfully intelligent in his own societal context, but he was not an educational leader, and certainly not a positive one" (p. 387).

Sternberg does not offer any grounds for this argument: presumably assuming the statement is self-evident to a reader. There seems a parallel here with the point made about wisdom in the previous chapter. In retrospect Stalin is certainly not considered to have been a 'positive' leader of the Soviet Union - not at least at this point in history. But again there is an assumption that that we can appeal to generally evident notions of what is good and positive, and what is not. Even if we accept this case, it is not made clear why Stalin's leadership was not educational.

I am not suggesting that Stalin *should* be seen as an 'educational' leader of his people, and perhaps Sternberg alludes to the general way in which information is restricted and distorted in a totalitarian state – which hardly reflects educational values. However, there is a suggestion that 'educational' is linked to positive and good – and that requires value judgements that may be difficult to make outside of a particular socio-historical context. Just as Stalin was once widely considered within the then Soviet Union to be wise (see above), he was also perceived as an educational leader: "Stalin's speeches and writings constituted 'a higher stage in the development of Leninism', the further development and enrichment of Leninism and the apex of Marxist-Leninist teaching…The guidance that Stalin gave in all areas of Soviet life was transmitted to the people through the reporting of his words in the press. All policies and actions which the government intended to implement were supported by

appropriate quotations from the writings or speeches of Stalin…The ever upward march of Soviet society toward communism was locked in a mutually reinforcing relationship with Stalin's writings and speeches, each other as irrefutable of the truth and correctness of both"
(Gill, 1980: 168-170)

Again Gill is not arguing that Stalin was as he was 'sold', but to the extent that the population he led (which is presumably how we are to interpret was Sternberg means by 'the field' in a political context) 'bought' into these ideas, this is how he was widely viewed at the time. It has been said of those times that the people's "thoughts continually turned to their great leader, *teacher*, father and friend" (Gill, 1980: 171, present author's *emphasis*).

In spite of this particular feature of Sternberg's writing being unconvincing (to this reader), this chapter – the final substantive writing on intelligence in the volume – is possibly the most useful for the general reader, as it reviews many of the ideas met earlier in the book in an attempt to build upon Sternberg's ideas about intelligence, creativity, and wisdom to produce a synthesis that can inform a notion of educational leadership.

The chapter is quite long, as it sets out the background to the WICS theory (much of which will by this time be familiar to anyone reading the chapters sequentially). The approach is intended to "systematically…combine wisdom, intelligence and creativity" (Sternberg, 2009m, p.386). Yet at the end of the chapter the new synthesis seems more an 'accumulation' of what has gone before rather than anything fundamentally new in terms of novel integrative insights. Perhaps that is in part because, as Sternberg acknowledges, this aspect of his work is still in progress; or perhaps this impression is simply the inevitable outcome of including so much overlapping material in the anthology.

Despite this, it is worth noting one point of particular importance made in several chapters in the anthology that gets emphasis again here. That is the extent to which one can 'choose' to take on key characteristics of intelligence.

Sternberg believes that many of the features associated with components of intelligence are open to development by suitable education, and that individuals can, to a certain extent, decide to develop particular features of intelligent behaviour. So Sternberg argues that in his theory "all of creativity, intelligence, and wisdom are largely decisions: One has to decide to approach a problem creatively, analytically,

practically, and wisely" (Sternberg, 2009m, p. 421). Accordingly, in the WICS model of leadership, people are less 'natural' leaders, than those who make choices to develop the component attributes, as: "WICS implies that leadership skills and attitude can be developed in anyone – that leadership is in large part a decision that anyone can make." (Sternberg, 2009m, p. 421).

Of course, this should not be taken to mean that such choices are easily made. To make such a choice one already needs to have developed certain frameworks for understanding the world that allow such choices to be meaningful and attractive; and one has to be in a context where such choices are viable. For example, someone who has come to believe that matters such as intelligence, creativity and wisdom are fixed and determined is not enabled to make such choices; not at least until they are persuaded that such choices are possible and available to them. However, it is easy to criticise the simplistic way that Sternberg presents his beliefs here: at least they offer inclusive possibilities.

Educators are all aware of the 'nature–nurture' debate, and hopefully few consider this as an 'either/or' matter. Genetics both facilitate and limits what is possible for human beings, but regardless of the extent to which we focus on the latter aspect, our genetics offer a range of possibilities to play out in interaction with environment. The key thing for teachers to bear in mind is that it is their role to maximise potential by influencing the aspect which is largely under our control, i.e. the environmental conditions. In that context Sternberg is important for highlighting the extent to which key traits that will influence individual's lives are open to development through educational experiences (self-directed or offered through schools etc.).

Sternberg discusses, for example, some work in Kenya where children's results on a test of tacit knowledge, based on as aspect of everyday life indigenous to the population concerned, i.e., herbal medicine, was found to negatively correlate with a traditional test of crystallised aspects of intelligence. The explanation mooted for this was based on the notion that limited learning resources tended to be invested either in informal learning of local cultural knowledge or in the imported Western style education provided in schools (which can therefore be seen as undermining an appropriate education in this context cf. Bowers, 2007). The implication here is that students who would appear most able in the context of the local conditions would be those who do not (choose to invest as much time and effort to) effectively learn the behaviours which are judged as intelligent on traditional Western intelligence measures,

> "The Kenya…study suggests that the identification of a general factor of human intelligence may tell us more about how abilities interact with

> patterns of schooling and especially Western patterns of schooling than it does about the structure of human abilities."
>
> (Sternberg, 2009m, p. 396)

This study seems reminiscent of Luria's work for Vygotsky among the peasantry of the Asian Soviets (Luria, 1976), where adults simply refused to engage in the word play of syllogisms used to test logical thinking (such as being asked to predict the colour of a bear seen by a traveler in the North where all the bears are white, even though they have personally never travelled to the North), having not been educated into the language game of such thought experiments through formal schooling. Luria's work seems indeed to offer some support for Sternberg's general mission to move beyond conventional studies of intelligence. Luria found that when given simple classification tasks, his participants often construed the tasks in different ways to those intended. In selecting the odd one out of hammer-saw-log-hatchet, the 'correct' answer is log as it is the one which is not a tool. However, Luria's informants were likely to see the hammer as the odd item in the group, as they tended to look for a narrative connection (e.g. the saw and hatchet are suitable for working with the log; but not the hammer). In terms of successful intelligence, we might suggest that these individuals were cued into applying their practical intelligence in the test situation, where the items were designed to elicit analytical intelligence.

Sternberg and Luria seem to come to similar conclusions from different perspectives. Although some later commentators have criticized Luria's stance as being biased to expect the thinking patterns he found where 'the masses had lived for centuries in economic stagnation and illiteracy' (Luria, 1976, p. vi) to be more 'primitive' than those characteristic of educated adults (Smagorinsky, 1995), he would certainly agree with Sternberg when he argues that "analytical skills can be taught" (Sternberg, 2009m, p. 400). This is part of his wider view that "intelligence is itself a form of developing expertise – that there is no clear-cut distinction between the two constructs" (Sternberg, 2009m, p. 401).

STERNBERG'S PERSONAL REFLECTIONS

The final section of the book comprises of six fairly short pieces of Sternberg's writing which might be characterised as somewhat of a more personal nature. The first of these is a short biographic note (first published in 2005 as one contribution to a book about psychologists who 'defied the crowd'), discussing how he became interested in intelligence testing whilst at school, and giving some insights into the academic life (Sternberg, 2009f). A key message here is that an academic should be prepared to take

risks to buck trends and to put making an eventual significant contribution above short-term safe career decisions.

This nicely ties in with Sternberg's notions of creativity, and it clearly has worked in his case. If one is convinced by Sternberg's arguments that being creative is a personal choice then it might seem like good advice! (If however one suspects that Sternberg was gifted a genetic disposition or had an early environment that somehow particularly supported his developing creativity, then one might reserve judgement on the basis of this case study of an especially successful academic.) Sternberg would probably remind us at this point that the creative person also needs practical intelligence to allow them to express their creativity through good decision-making in when to "(a) adapt to, (b) shape, and (c) select environments." (Sternberg, 2009m, p. 394). Certainly the message that it is important to find an institution and intellectual environment which supports the work you want to do is clearly good advice for any new academic - if in practice many are grateful enough to receive any offer of a permanent position. The chapter is very readable, even amusing, and offers some very good advice on taking a balanced view to referees' reports.

The second item in this section is a paper co-written with Elena Grigorenko (one of the two authors of the anthology), first published in 2001 in the periodical *American Psychologist*, on 'unified psychology' (Sternberg & Grigorenko, 2009). This is probably the most substantive document in this section of the book, and argues for a more inclusive better integrated discipline of psychology that would be a "multiparadigmatic, multidisciplinary, and integrated study of psychological phenomena through converging operations" (p. 447), the latter being "the use of multiple methodologies for studying single psychological phenomena or problem" (p. 450).

Such a stance would seem to reflect Sternberg's work in intelligence, where he has tried to link intelligence testing with the kind of problems people tend to face in the fuzzy 'real' word, and where has forged links with constructs such as creativity that are often considered discretely.

The next contribution is a very short item on 'fads in psychology' that Sternberg wrote for the APA Monitor (Sternberg, 2009d), and that was first published in 1997. The following chapter is an equally short 2003 item from the same periodical about the American Psychological Association (APA) - along the lines that the APA is flawed, but the best the profession has and worth working to improve (Sternberg, 2009b). The penultimate contribution was published in 2005 in *Eye on Psi Chi* - the quarterly magazine of the International Honor Society in Psychology (Sternberg, 2009g). Honor

societies are network organisations (for campus-based student 'chapters') that have been set up in an area of scholarship, and which restrict membership in terms of academic achievement. This might seem rather elitist to readers in many parts of the world – but is an accepted part of U.S. academic life. According to its website, the International Honor Society in Psychology requires students to both be in the top 35% of their class, and to reach a minimum GPA, to be considered for membership[1].) In this article Sternberg argues that "the biggest problem facing the United States – and the world" (p. 471) is leadership, but that this issue does not receive sufficient attention in academic psychology (Sternberg, 2009g). In the article Sternberg briefly outlines some of his ideas about successful intelligence, creativity and wisdom – all areas well covered in earlier chapters.

The final chapter has a specific educational focus and will be of more direct interest to many teachers. This contribution was first published in *Education Week* in 2004, and discusses the 'No child left behind act', which was major enactment of educational policy in the US (Sternberg, 2009e). Sternberg characterises the act as 'well-intentioned', but suggests a wide range of reasons why it is counter-productive. These include the reliance on high stakes tests that are limited both in terms of the types of assessment items used, and in terms of distorting the curriculum towards 'basics' such the so-called 'three R'. Given the key foci of his own work, it is clear why Sternberg is critical of over-emphasis in these areas. Sternberg also criticises the failure to judge schools on measures which take fair account of the socio-economic profile of the student intake, and suggests that schools may effectively 'cheat' to improve their ratings on output measures by which they will be praised or dammed.

Sadly, to an observer in the UK, much of this is very familiar. The UK is just emerging from a decade or so in which the primary (in particular) curriculum-as-enacted became increasingly distorted as student achievement on national assessments for literacy and numeracy (and science to a lesser extent) became a major focus for evaluating schools. Government policy to improve standards became tied to expecting year-on-year improvements in levels achieved at key ages – and given such a priority, examination boards, schools and teachers managed to find ways to provide the 'objective' evidence that, due to government policies and investment, more and more students could meet the expected levels on the standard tests. Of course, this included a good deal of teaching to the test, and necessarily in many schools a good deal less teaching towards what was unlikely to be tested. Sternberg implies that in the US there has been

[1] http://www.psichi.org/about/becomember.aspx, accessed 2nd January 2010.

widespread cheating under the pressures of the Act. In the UK, actual cheating was probably not so common, but the adoption of tactics to maximise valued outcomes is almost inevitable in such contexts.

For example, the school leaving examination in England, taken (generally) at age 16 in a range of subjects (the General Certificate of Secondary Education, GCSE), leads to the award of grades recognising a wide range of achievement levels: A*, A, B, C, D, E, F and G. A key statistic used to judge schools has been the proportion of 16 year olds to attain 5 or more passes at grades C or above. Inevitably some schools chose to focus extra resources – not on the weakest students who might be considered to need it most, or on the gifted who often find limited challenge in the school curriculum – but on those pupils considered to be on the C-D boundary, where a small improvement in performance could have major pay-off in school league tables. Schools can hardly be blamed for adopting such approaches when the government itself issued special ('booster') teaching materials to help school target students approaching national assessment tests who might be shifted to the level of attainment considered desirable at that age group.

Perhaps even more disturbing, the accountancy agenda in the UK pressures schools into considering entering students for courses which may not be best suited to them - because some schools judge that less academic students may have more chance of meeting the 5 passes criterion if entered for alternative qualifications which are considered as counting for 4 of the 5 needed subjects (so only one additional pass is needed). Courses designed for students with particular interests and aptitudes can be seen by schools as a relatively easy route to increasing their overall rate of 5 or more passes, regardless of whether many of the students concerned might have a more balanced, interesting educational experience following the traditional courses. Sternberg's criticisms would seem to apply well beyond the US and the specific 'no child left behind' act. As he notes, "forcing standards on schools dreamed up by politicians never has been, and never will be, the right way to create the best education for our children" (Sternberg, 2009e, p. 481).

OVERVIEW

Overall this book offers an excellent introduction to Steinberg's work in the broad area of intelligence. I would not consider it the ideal introduction for the general reader (such as the teacher wanting an overview of Sternberg's theories) for two reasons, both alluded to earlier in this review. For one thing, there is too much repetition of material as each chapter was originally an article that had to stand on its own. Secondly much of

the technical material (e.g. details of statistical tests) will be of limited interest to such a general reader.

The anthology approach also naturally introduced some sense of uncertainty where the material was written over a good number of years as ideas were being developed, tested, modified, adopted into new areas etc. The nuances intended for the same term may seem to have somewhat different meaning in different parts of the book. A general reader might have benefited more from a book much shorter than this, that simply set out a single coherent account of the work reported here from the perspective of where Sternberg's thinking has now reached.

In part the impression of somewhat shifting meanings may be attenuated by the choice of terminology that Sternberg was adopted over the years. One tension in this area of work, well illustrated by the present volume, is the tension between starting from everyday folk notions that may themselves be vague and multi-facetted and working with well defined and measurable constructs that then have to be shown to have some relevance to things that people might actually value and think are of interest. This is of course the issue I raised right at the start of this review.
In this regard it may not be an accident that references to the triarchic theory of intelligence in early work seems to have been largely replaced by the more familiar (and user-friendly) label of 'successful' intelligence in later writing. For Sternberg seeks notions of intelligence that genuinely reflect qualities that allow us to behave 'intelligently' in real life contexts.

Yet there is potential for some confusion in adopting lay terms and relating them to psychological constructs. This may be particular so for someone like Sternberg who acknowledges he tends to be 'integrative' (Sternberg, 2009f, p. 441). The reader of this volume has to keep in mind how terms such as intelligence, creativity, creative intelligence, successful intelligence, practical intelligence, wisdom etc. are being used as the different theories are linked together:

> "intelligence… a basis for creativity and for wisdom and …creativity is … essential as well for wisdom…which builds on but goes beyond intelligence and creativity." (Sternberg, 2009m, p. 387)

> "Creative intelligence is a part of but not the entirety of human creativity" (Sternberg, 2009m, p. 423)

> "…social intelligence…is viewed in the theory of successful intelligence as a part of practical intelligence"
>
> (Sternberg, 2009m, p. 395)

And as each of these terms carries life-world baggage, there is always the sense of tension between the referents as being descriptive constructs looking to define what people mean by these terms or prescriptive constructs of some idealised normative system. The former perspective might be glimpsed when the most chosen responses on practical intelligence items are used as proxies for the 'right' answers

> "The measure of practical intelligence was self-report and also comprised two parts.…Obviously, there is no one "right" answer in this type of situation. Hence Grigorenko and Sternberg used the most frequently chosen response as the keyed answer. To the extent that this response was suboptimal, this suboptimality would work against the researchers in subsequent analyses relating scores on this test to other predictor and criterion measures."
>
> (Sternberg, 2009m, pp. 398-399)

Whereas the latter approach seems to be indicated in Sternberg's strong commitment to seeing wisdom as for the common good:

> "If one's motivations are to maximize certain people's interests and minimise other people's, wisdom is not involved. In wisdom, one seeks a common good, realizing that this common good may be better for some than for others."
>
> (Sternberg, 2009m, p. 415)

Yet these weaknesses in terms of how the book might appeal to a general reader, can also be strengths for those with an interest in the research process itself. Some of the chapters, being unedited papers first published in research journals, give a lot of technical detail. This will be valuable for the researcher or graduate student interested in the field of intelligence, even if not 'essential Sternberg' for professional readers with an interest primarily in how the research can directly inform better, and perhaps fairer, practice in the classroom.

Much of the material offered here offers interesting insights into the research process, and the complexities of working with messy data sets and modern statistical techniques. So in one chapter we are told that an analysis that did not include an attempt to make corrections in awarded GPAs for students attending different status colleges was rejected on those grounds by one set of referees; but a subsequent analysis that made such a correction was rejected for doing so by a second set of referees

(Sternberg & The Rainbow Project Collaborators, 2009). Such an experience will resonate with many academics. The peer-review system, whilst remaining the best way of maintaining academic quality that we have, can be frustrating at times. In another chapter we find the authors regretting being 'overly conservative' in selecting a statistical approach that may have reduced their chances of finding significant differences that might have supported their case (Stemler et al., 2009).

Moreover, the repetition and subtle shifts in meaning, across the different studies describe here, offers a rare glimpse of research within a coherent research programme over an extended period of time. It is fascinating to see how the same researcher has moved forwards across several related fronts, and developed a theoretical model whilst remaining true to a mission to "to move beyond conventional theories of intelligence". Any young academic, especially one being advised to put aside their pet interest or topic to work in more fertile fields, can find encouragement in this collection of writings.

Students and teachers should also be encouraged by a book that tells us that intelligence is multifaceted; needs to be understood in its cultural context; and - most of all - is open to being developed and shaped by teachers, and chosen by learners everywhere.

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