# **Illusory Intelligences?**

## JOHN WHITE

Howard Gardner's theory of Multiple Intelligences has had a huge influence on school education. But its credentials lack justification, as the first section of this paper shows via a detailed philosophical analysis of how the intelligences are identified. If we want to make sense of the theory, we need to turn from a philosophical to a historical perspective. This is provided in the second section, which explores how the theory came to take shape in the course of Gardner's intellectual development. The third section looks at changes in the theory since its inception in 1983 and at problems with its applications to education. The paper concludes with a response to Gardner's critical comments on the argument to this point.

#### 1 CAN GARDNER'S MULTIPLE INTELLIGENCES BE JUSTIFIED?

The theory of multiple intelligences has been influential in school reform across the world. In England, for instance, it is widely used to back the idea that pupils have preferred 'learning styles': some make better progress if they can involve their musical or interpersonal or other strengths in their learning than if they have to be dependent on language ability alone.

But does MI theory hold water?

Everything turns on the claim that there are a few relatively discrete intelligences: linguistic, musical, logico-mathematical, spatial, bodilykinaesthetic, intrapersonal and interpersonal, to which have now been added naturalist and possibly existential intelligences. One reason for the popularity of MI theory is its rejection of the unitary general intelligence associated with IQ testing. Children who have been seen, or have seen themselves, as dim are recognised to have other strengths. This is an important thought. But it could be true and MI theory false. Long ago Gilbert Ryle reminded us that 'the boxer, the surgeon, the poet and the salesman' engage in their own kinds of intelligent operation, applying 'their special criteria to the performance of their special tasks' (Ryle, 1949, p. 48). On his view, intelligent action has to do with flexible adaptation of means in pursuit of one's goals. This means that there are as many types of human intelligence as there are types of human goal.

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Gardner has corralled this variety into a small number of categories. Is this justified?

How does Gardner identify his intelligences? The basic text here is Chapter 4 of *Frames of Mind: The Theory of Multiple Intelligences*. He writes:

First of all, what are the prerequisites for an intelligence: that is, what are the general desiderata to which a set of intellectual skills ought to conform before that set is worth consideration in the master list of intellectual competences? Second, what are the actual criteria by which we can judge whether a candidate competence, which has passed the 'first cut', ought to be invited to join our charmed circle of intelligences? (Gardner, 1983, p. 60).

Identifying an intelligence is thus a two-stage process. It has to satisfy the prerequisites; and it has to meet the criteria.

# 1.1 Prerequisites

The first of these is crucial. If a candidate fails here, it stands no chance. Gardner tells us that: 'A human intellectual competence must entail a set of skills of problem-solving ... and must also entail the potential for finding or creating problems—thereby laying the groundwork for the acquisition of new knowledge. These prerequisites represent my effort to focus on those intellectual strengths that prove of some importance within a cultural context' (pp. 60–1). He adds that: 'a prerequisite for a theory of multiple intelligences, as a whole, is that it captures a reasonably complete gamut of the kinds of abilities valued by human cultures' (p. 62).

1.1.1 Failing Candidates Which candidates fail and which pass the test? Among failures, Gardner includes the 'ability to recognize faces' (p. 61). This is because it 'does not seem highly valued by cultures'. Is it true that the ability to recognise faces is not valued by cultures? This seems counterintuitive. For if most of us could not recognise the faces of our relatives, friends, colleagues, or political leaders, it is hard to see how social life would be possible. How can one tell, in any case, whether an ability is culturally important? Gardner writes as if there are clear tests at this first of the two filters. Yet his very first example of a failure is disputable.

1.1.2 Successful Candidates The candidates passing the first test obviously include Gardner's intelligences. They must have all been picked out for the high value that human cultures have placed on them.

Are we talking about all human cultures, most, or only some? Gardner is not clear on this. On the one hand, he says: 'The prerequisites are a way of ensuring that a human intelligence must be genuinely useful and important, at least in certain cultural settings' (p. 61). This looks like *some* cultures. On the other, a later work tells us: 'The theory is an account of human cognition in its fullness—I put forth the intelligences as a new definition of human nature, cognitively speaking' (Gardner, 1999a, p. 44). This looks like *all*. Whichever of these answers it is, how would we find out what human societies have valued? We have historical evidence stretching back a few millennia; and patchy archaeological evidence taking us back another few. Beyond that there are only commonsense hunches. Foodproviding skills, for instance, must surely always have been highly prized.

The 'first cut' selection of the seven original intelligences must have been based on something other than a scientific study of skills that all or nearly all human societies have valued. I will come back to this later. In addition, there are other skills, not included among the intelligences, which have as much prima facie plausibility for this title as those included. I have mentioned food-providing skills, but we might also add shelter-providing skills, medical skills, child-rearing skills. Why did Gardner not discuss *these*?

As we have seen, he does not approach his prerequisites via a comprehensive consideration of what the valued problem-solving skills in any human society might have been, drawing on whatever empirical data is available. His decisions must rest on something more subjective. I will say more about this later.

# 1.2 Criteria

Once a candidate intelligence has satisfied the prerequisites, it has to meet various criteria. These comprise:

- potential isolation of the area by brain damage
- the existence in it of idiots savants, prodigies and other exceptional individuals
- an identifiable core operation/set of operations
- a distinctive developmental history, along with a definable set of expert 'end-state' performances
- an evolutionary history and evolutionary plausibility
- support from experimental psychological tasks
- support from psychometric findings
- susceptibility to encoding in a symbol system (Gardner, 1983, pp. 62–9).

*1.2.1. Problems with specific criteria* There are specific problems about several of these items, as well as problems about the criteria in general. I begin with specific items. For convenience, I begin with two of them taken together.

- an identifiable core operation/set of operations
- a distinctive developmental history, along with a 'definable set of expert "end-state" performances'

The interconnectedness of these two can be illustrated by reference to linguistic intelligence. This has as its 'core operations' a sensitivity to the meaning of words, to order among words, to the sounds and rhythms of words, and to the different functions of language (p. 77). These core operations are seen at work 'with special clarity' in the work of the poet.

Linguistic intelligence also possesses a distinctive developmental history, culminating in expert 'end-state' performances like those of the poet. Syntactical and phonological processes lie close to the core, since they unfold 'with relatively scant need for support from environmental factors' (pp. 80–1). Other intelligences illustrate the same point. Musical intelligence involves, as core operations, pitch, rhythm and timbre (pp. 104–5). It begins in infancy with rudimentary singing (p. 108) and develops towards end-states exemplified this time by proficient composers. Spatial intelligence develops from such core abilities as perceiving the visual world accurately, performing transformations on one's visual experience, and recreating aspects of the latter (p. 173). The expert end-state performances are painting, sculpture and the sciences. Similar claims are made about the remaining intelligences.

Gardner's theory of intelligence is developmentalist. Developmentalism is the theory that the biological unfolding between two poles from seed through to mature specimen that we find in the physical world-e.g. of plants, or human bodies—is also found in the mental world. In his criteria, Gardner acknowledges the two poles in the mental case. At one end, there are allegedly genetically given capacities common to human beings like visual perception, innate knowledge of the rules of language (following Chomsky-see Gardner, 1983, p. 80), the ability to move our bodies in different ways etc. At the other end is the mature state, the 'definable set of expert "end-state" performances' mentioned among the criteria. We have already seen examples in the highest flights of poetry, music, painting, sculpture and science. Intrapersonal intelligence, whose core capacity or mental seed is 'access to one's own feeling life', finds its full development in the work of a novelist like Proust or the patient or therapist 'who comes to attain a deep knowledge of his feeling life' (p. 239). Interpersonal intelligence, arising out of the primitive 'ability to notice and make distinctions among other individuals' generates its 'highly developed forms ... in political and religious leaders (a Mahatma Gandhi or a Lyndon Johnson), in skilled parents and teachers' etc. (ibid.).

1.2.2 Problems in Developmentalism Gardner's theory faces an objection besetting all forms of developmentalism. The latter is based on the assumption that the unfolding familiar in the biological realm from seed to mature state is also found in the mental. The assumption is often taken as read in psychological and educational circles, but is deeply problematic. I shall now summarise its chief difficulties as illustrated in Gardner's own writings, a fuller account being available in my paper 'Multiple Invalidities' (2006).

1.2.2.1 Biological seeds, including the union of sperm and egg, *have* within them the power to unfold into more complex stages, given appropriate environmental conditions. To locate a mental equivalent it is not enough to pick out innate capacities. We are all born with the power to see and hear things, to move our bodies, to desire food and drink, to feel pain and pleasurable sensations. But these abilities do not have within them the power to *unfold* into more complex forms. Toothaches one has in the course of one's life do not grow into more advanced forms of the same thing. Many of the powers just mentioned can *change* into more sophisticated versions: the desire for food, for instance, becomes differentiated into desires for hamburgers and ice-cream. But this kind of change—driven by social expectations—is not an unfolding.

1.2.2.2 The second problem concerns the other pole, the mature state— Gardner's 'end-state'. We understand this notion well enough in physical contexts like fully-grown hollyhocks or human bodies. A fully-grown human body is one that can grow no further: it has reached the limits of its development. It can certainly go on *changing*, but the changes are to do with maintenance and deterioration, not further growth. If we apply these ideas to the mind, do we want to say that all human beings have mental ceilings—e.g. in each of Gardner's intelligences—beyond which they cannot progress? This goes against the grain for many of us. We like to think of our intellectual life as expandable and deepenable, in principle, in all sorts of directions. True, psychologists like Cyril Burt have built the notion of mental ceilings into their notion of intelligence, but their views have been rightly criticised. The claim that we all have individually differing intellectual limits is both unverifiable and unfalsifiable. It is not a scientific claim (see White, 1998a, pp. 29–32).

One answer to this might be that the development of intelligence is unlike physical development in that here there are no ceilings, simply the potential for endless growth. Grounds would have to be provided for this claim—which is tantamount to saying that mental development fails to manifest a feature found in biological development. But if we leave this on one side, the claim still includes the idea of growth towards states of relative maturity, even if ceilings are not to be found. It is not clear whether Gardner would embrace this claim. On the one hand he writes of 'end-state' performances (Gardner, 1983, p. 64), which suggests finality; on the other, he describes the process of development as leading to 'exceedingly high levels of competence', which does not.

Whichever view he takes, he still has to say *what counts* as maturity in the case of the intelligences. With the oak tree and the human body, we know through the use of our senses when maturity has occurred: over time we can *see* that a person is fully grown, physically speaking, or that an oak tree has reached its full dimensions. What equivalent is there in the mental realm? How do we know either that people have reached their mental ceiling or, on the ceiling-less view, that they are more mentally mature than they were?

We do not just use our senses. We cannot see a person's intellectual maturity as we can see that he or she is physically fully grown. So how *do* we tell? In ordinary life we make all sorts of judgments about people's intellectual maturity. These judgments tend to be controversial. Some people

would understand intellectual maturity in quiz show terms; others would emphasise depth of understanding; yet others a synoptic grasp of connections between different fields; and so on. Judgments of mental maturity lack the consensus found in judgments about fully-grown pine trees or badgers. This is because different people apply their own value judgments.

Gardner's examples of high levels of development in the intelligences seem to reflect his own value judgments about what kinds of qualities are important. He starts-in his 'prerequisites'-from problem-solving skills important within cultures. He has in mind the achievements of outstanding poets, composers, religious leaders, politicians, scientists, novelists. So 'end states' are identified not by observation of what happens in nature, as with plants or bodies, but by what Gardner sees as socially valuable. His value judgments, not any empirical discoveries as a scientist, are his starting point. True, in his introduction to the second edition of Frames of Mind, Gardner backs off from using only ethically acceptable persons as illustrations: 'intelligences by themselves are neither pro-social nor antisocial. Goethe used his linguistic intelligence for positive ends, Goebbels his for destructive ones; Stalin and Gandhi both understood other individuals, but put their interpersonal intelligences to diverse uses' (Gardner, 1993, p. xxvi). But this casts doubt on whether 'end-states' are always achievements valued within a culture-and so negates what he says about 'prerequisites'. Whether we look towards the seed or towards the full flowering, we find insuperable problems in identifying mental counterparts to physical growth. Since developmentalist assumptions are central to Gardner's theory, this seriously undermines it.

### • 'susceptibility to encoding in a symbol system'

Gardner writes: 'following my mentor Nelson Goodman and other authorities, I conceive of a symbol as any entity (material or abstract) that can denote or refer to any other entity. On this definition, words, pictures, diagrams, numbers, and a host of other entities are readily considered symbols' (Goodman, 1968, p. 301). It is important to see how wide the range of Gardner's symbols is. They include not only obvious ones like words and mathematical symbols, but also paintings, symphonies, plays, dances and poems. It is because works of art are symbols in his view that he can connect many of his intelligences with their own kind of symbolic entities. For instance, words are not the only symbols associated with linguistic intelligence: also associated with this are such symbols as poems.

Gardner writes: 'In addition to denoting or representing, symbols convey meanings in another equally important but less often appreciated way. A symbol can convey some mood, feeling or tone ... Thus a painting, whether abstract or representational, can convey moods of sadness, triumph, anger, or 'blueness' (even if the painting itself is red!) (Gardner, 1983, p. 301). Gardner, following Goodman, is saying that some things—works of art—are symbols in that they convey or express feelings or moods. But just because works of art can be expressive of emotion, it is

hard to see why they should be called 'symbols' for that reason. What are they symbolising? One can understand the notion readily enough when talking about words, flags or communion wine. In each of these cases one can draw a distinction between the symbol and what it is a symbol of: cats, America, the blood of Christ. If a song is a symbol in the same way, what is the thing symbolised?

The use of the term 'symbol' in Gardner's work is obscure. If in an artistic context 'symbolising' means no more than 'expressing feeling', the term is redundant. In addition, 'symbol' now comes to have a different meaning in the arts from what it has in language and in mathematical thinking. Without going through all the other criteria, a word about two of them.

# • 'the potential isolation of the area by brain damage'

The criteria to do with development and with symbol are central items on Gardner's list. This can be seen if one tries to imagine their absence. I shall come back to the centrality of the symbol criterion later. Meanwhile let us imagine the exclusion of the development criterion. Suppose we take what appears to be the weightiest of the other criteria: 'the potential isolation of the area by brain damage'. And let us take it that there are localised areas of function within the brain. If one part of the brain is damaged, one's sight is impaired, if another, one's ability to move one's left hand, or feel pain, or talk, or understand speech. What this shows is that certain physiological necessary conditions of exercising these capacities are absent. It does not help to indicate the existence of separate 'intelligences'. It is well known that language ability is impaired through brain injury to parts of the left hemisphere of the cerebral cortex. But the injury could in principle impair wired-in abilities implicated not only in language use but in all sorts of other things as well; and there does indeed seem to be empirical evidence that this is the case (Richardson, 1999, pp. 85–8). The capacities in question are not those of a language module but of 'much more general and lower-grade functions' (Gardner, 1983, p. 87).

Given his developmentalism, one can understand why Gardner should look to brain localisation in order to identify intelligences, for he has to provide an account of the 'seed' that is to unfold into its mature form, and this seed has to be part of our original, biologically given, constitution. But the kinds of function picked out by brain localisation research do not have the power, as far as I can see, to grow into more developed forms. I am indeed born with the power of vision or the power to move my thumbs, but although various forms of socialisation are built on these abilities, the latter do not *unfold* into maturer versions of themselves.

• 'the existence, in an area, of idiots savants, prodigies and other exceptional individuals'

Gardner invokes the existence of *idiots savants* to support his theory, but what I know of them does not lead me to think of them as intelligent. Well known recent examples include an 11-year-old London boy who can

draw complicated buildings perfectly having just seen them; a 23-year-old man who can play piano pieces perfectly having heard them only three times; and a young man who can tell you the day of the week of any date presented to him. All these cases are of subnormal mental ability. What they all have in common is a *mechanical* facility, one that lacks the flexibility of adapting means to ends found in intelligent behaviour.

Prodigies only support Gardner's case if there is good evidence that their talents are innate. But the evidence seems to point to acquired abilities (Howe, 1997, pp. 131–2)

1.2.3 Concluding Comments about Specific Criteria It would be natural to think that the 'criteria' against which one measures candidate intelligences that have survived the 'prerequisites' requirement are all straightforwardly applicable—in the sense that it is an empirical task to look at the relevant facts and come to a judgment. But this is not so, as the critique of five of the more important of the eight criteria has shown. In addition, the criteria to do with development and with symbols presuppose the truth of dubious *theories*—one in psychology, the other Goodman's theory of aesthetics. This undermines the validity of MI theory as a whole. Just as the discussion of the 'prerequisites' showed that the theory rests ultimately on value-judgements rather than empirical evidence, this discussion of particular criteria provides further evidence of its non-scientific nature. Yet more grounds for this conclusion are given in the sections 1.2.4 and 1.2.5 below.

1.2.4 How Are the Criteria to be Applied? How does one use the criteria to pick out intelligences? If they are all necessary conditions, each has to be met before we can say that an intelligence exists. Although some of them seem to be necessary-to judge by remarks like 'an intelligence must also be susceptible to encoding in a symbol system' (Gardner, 1990, p. 933), in his original work Gardner makes it clear that not all have to be satisfied (Gardner, 1983, p. 62). In places, the demand is more stringent. In his 1990 discussion of how he came to pick out his intelligences, he writes that 'only those candidate intelligences that satisfied all or a majority of the criteria were selected as bona fide intelligences' (Gardner, 1990, p. 932). If this is to be taken literally, then if five or more of the eight criteria listed are met, a candidate automatically passes the test. But Frames of *Mind* states that there is no 'algorithm for the selection of an intelligence, such that any trained researcher could determine whether a candidate intelligence met the appropriate criteria' (p. 63). Rather, Gardner goes on: 'At present, however, it must be admitted that the selection (or rejection) of a candidate intelligence is reminiscent more of an artistic judgment than of a scientific assessment' (p. 63).

The identification of intelligences appears, then to be a subjective matter, depending on the particular weightings that Gardner gives to different criteria in different cases. It is worth dwelling on this point. Gardner sees it as a special virtue of his theory, which differentiates it from rival ways of classifying basic intellectual abilities—like Paul Hirst's account of the 'forms of knowledge', for instance—that it is *scientifically* based and not derived *a priori* (Gardner, 1983, pp. 61–2). In saying that selecting intelligences is more like making an artistic judgment than a scientific assessment, Gardner thus seems to be contradicting himself. The subjective, non-empirical nature of his theory has also been shown above. We have seen how the 'prerequisites' are not based on empirical investigation of what different societies have held to be valuable; and that the 'criteria' depend on theories in psychology and aesthetics that themselves are not empirically founded. But it is in his above remark on how the intelligences are identified via the criteria, that the subjectivity is most striking. The issue of identification is crucial. If we have no objective way of identifying them, we have no reason to think that the multiple intelligences exist.

Gardner has replied to the charge I made originally in my 'Intelligence Guru on a Sticky Wicket' (White, 1998b), based on this same quotation, that his choice of intelligences is subjective. He wrote: 'White correctly notes that my original list depended on the judgment of a single analyst, who made his data available to others. However, White is naïve if he believes that science begins in any other way' (Gardner, 1998). What he may have in mind is the Popperian point that science begins with conjectures. But not all conjectures eventuate in science. Some may prove empirically untestable. A fundamental question about MI theory is whether it is empirically testable. Because it is not clear when a candidate intelligence passes or does not pass the 'criteria' test, it is uncertain under what conditions it may be empirically refuted.

1.2.5 Why These Criteria? A further question is: how does Gardner justify using these particular criteria? I have not been able to find any answer in his writings. Whenever he introduces the criteria, they are each spelt out in some detail, but there is no account of why these ones have been employed and not others. This is, if anything, an even more striking blow to the theory than the admission that the way the criteria are to be applied is more artistic than scientific. If we are given no good grounds for using these eight criteria, why should we take MI theory seriously?

#### 2 CAN GARDNER'S MULTIPLE INTELLIGENCES BE EXPLAINED?

When justification falters, explanation may shed light. A philosophical critique of Gardner's theory has failed to find a rationale for it. This leaves us in an intellectually unsatisfying position. We still feel the need to understand the theory, even if we cannot make logical sense of it. At points like this, one has to turn from philosophy to history. In another context, this is true of the credentials of the traditional subject-based school curriculum, embodied, for instance, in the English National Curriculum of 1988. Having detected no defensible justification of it, I

have found it profitable to explore its origins in Victorian educational policy and before. The pieces of the jigsaw have all then fallen—more or less—into place.

The curriculum story, which I hope soon to publish, led me back finally to the mid-16th century. Fortunately, the explanation of MI theory goes back only forty years. It concerns Gardner's own intellectual biography. Much of this has to do with the two major criteria examined above—about development and symbol systems.

### 2.1 Origins

The historical story runs like this. In the 1960s Gardner began his career as a developmental psychologist, profoundly influenced by Piaget as well as by structuralist thinkers in other fields, notably Claude Lévi-Strauss in anthropology: 'The structuralists are distinguished first and foremost by their ardent, powerfully held conviction that there is a structure underlying all human behaviour and mental functioning' (Gardner, 1972, p. 10). The young Gardner was also enthusiastically involved with music and other arts (Gardner, 2003, p. 1). As he was dissatisfied by the rationalism of the Piagetian approach, his first research was on a developmental psychology of the arts (Gardner, 1982, p. xii). He found the structuralist view that the direction of human thinking is preordained problematic. It could not account for innovation and creation, not least in the arts. Gardner found the key to understanding creativeness in the notion of symbol systems: 'These symbol systems-these codes of meaning-are the vehicles through which thought takes place: by their very nature they are creative, open systems. Through the use of symbols the human mind, operating according to structuralist principles, can revise, transform and re-create wholly fresh products, systems, and even worlds of meaning' (pp. 4-5). All this shows the centrality of theories of development and of symbol systems in Gardner's pre-1983 thinking. Much of his published work in this period was about the application of developmental psychology to the arts. He describes his 1973 book The Arts and Human Development as 'fleshing out the picture of development proposed by Piaget' (Gardner, 1973, p. vii).

Pivotal to this extension of Piagetian ideas to the arts is the notion of a 'symbol'. Here Gardner was influenced by the aesthetician Nelson Goodman, his colleague at Harvard in the 1960s. Goodman saw works of art as a whole as symbols and also as containing symbols within themselves. Different arts, he held, have their own symbol schemes—hence the title of his *Languages of Art* (Goodman, 1968). Some artistic symbols have a denotating function, as words do, in that they stand for something outside themselves. Others 'exemplify' rather than denote. A sad piece of music exemplifies sadness generally. Understanding a work of art is a matter of interpreting correctly what and how it symbolises. The arts, for Goodman, are forms of knowledge.

Gardner's early intellectual biography throws light on MI theory, especially the first five intelligences: linguistic, musical, logico-mathematical, spatial and bodily-kinaesthetic. Of these, logico-mathematical intelligence is related particularly to mathematics and science and its treatment follows Piaget's scheme quite closely. The other four reflect Gardner's work in extending Piagetian developmentalism into the arts: poetry is prominent in the chapter on linguistic intelligence, music in that the musical chapter, the visual arts in the spatial, mime and dance in the bodily-kinaesthetic. Piaget's and Goodman's theories are examples of developmentalism and the symbol theory of art respectively, both of which were criticised above. In addition, there are further conceptual problems damaging to these two theories taken specifically. These have been explored by David Hamlyn in the case of Piaget (Hamlyn, 1967, 1978) and Roger Scruton in the case of Goodman (Scruton, 1974).

### 2.2 The van Leer Project

A crucial turning point for Gardner came in 1979, when he moved from his long-standing project on the development of artistic competences to a wider, now all-embracing, theory of intellectual development. This came about through his involvement in the Harvard Project on Human Potential funded by the Bernard van Leer Foundation. The Foundation 'asked the Harvard Graduate School of Education to assess the state of scientific knowledge concerning human potential and its realization and to summarize the findings in a form that would assist educational policy and practice throughout the world' (Gardner, 1983, p. x). Gardner was the psychologist in an interdisciplinary team that also contained philosophical and anthropological expertise. *Frames of Mind* (1983) was the first publication from the team.

The first five intelligences in the book drew, as we have seen, on Gardner's pre-1979 work in the Piagetian and Goodmanian traditions and areas of interest. The other two were the personal intelligences—which have to do with understanding oneself and understanding other people. It is understandable that Gardner should wish to include other areas of interest than mathematics, science and the arts. The van Leer remit wanted something more comprehensive. In answer to his own question 'why have I incorporated personal intelligences in my survey?', Gardner wrote: 'Chiefly because I feel that these forms of knowledge are of tremendous importance in many, if not all, societies in the world (Gardner, 1983, p. 241). This is revealing—and not only for its use of the expression 'forms of knowledge', about which I say more below. It shows again how MI theory is built on value judgments. The personal intelligences pass the 'prerequisites' test because of their huge social importance in Gardner's view.

He then sees how far they pass the second, 'criteria' test. They do not meet these, in my view, very well. His section on 'the development of the personal intelligences' from infancy through to maturity (pp. 243–253) gives evidence of increasingly sophisticated *changes* in understanding,

but not of *unfolding*. As Gardner for the most part treats 'the development of personal knowledge as a relatively natural process' (p. 253), he radically underplays the role of young children's mentors, especially their parents, in inducting them into this kind of understanding. The symbol test does no better. Gardner admits that there are no symbols unique to this area, only those of language in general (p. 242). In addition, what he says about brain lesion evidence points to changes in *mood and emotion*, e.g. depression, following injury to the frontal lobes, but not to changes in *understanding*. He himself says that positive evidence is sparse with regard to the criteria to do with evolutionary evidence, exceptional individuals, experimental psychology and psychological testing (ibid.). Despite all this discouraging news, the two intelligences somehow get their diplomas.

To come back to Gardner's use of the phrase 'forms of knowledge'. It is not coincidental that the expression is also closely associated with Paul Hirst's early theory of a liberal education. Gardner has always said that nothing has turned for him on the use of the term 'intelligences' (Gardner, 2003, p. 4) He has written: 'I would be satisfied to substitute such phrases as "intellectual competences", "thought processes", "cognitive capacities", "cognitive skills", "forms of knowledge", or any other cognate mentalistic terminology' (p. 284). The crucial issue for Gardner has been not what words to use, but how far these various intelligences/forms of knowledge can be shown to exist by scientific evidence rather than by *a priori* reasoning. If his own empirical approach to demarcating intelligences should fail, 'then we may have to rely once more on *a priori* schemes, such as Hirst's' (pp. 61–2).

This raises a key question. If Gardner's intelligences are in the same ballpark as Hirst's forms of knowledge-and indeed as 'the medieval trivium and quadrivium' (ibid.), can they still be equated with abilities or talents? From the former point of view, they come out as ways of categorising the realm of intellectual phenomena; from the latter, as ways of categorising individuals' intellectual competences. For Gardner at this time the two ways of classifying were linked. He saw his theory as bridging the (bio-psychological) world of individual nervous systems and the (epistemological or anthropological) world of social forms. Symbols have a central role in this: 'The domain of symbols ... is ideally suited to help span the gap between the aforementioned entities' (Gardner, 1983, p. 300). Outside Gardner's theory, the two classifications can be kept apart. Hirst, for instance, saw himself as doing epistemology, not psychology. His theory is about how knowledge is to be logically carved up, not about individuals' abilities. For Gardner, the two spheres are inseparably connected. This is implicit in his developmentalism and his symbol theory: abilities unfold from seeds within the nervous system towards mature end-states found in different intellectual activities; and it is through the acquisition of symbols that these end-states are those of the highest flights of creative activity. Because of this inseparable connection, studying one pole of the process throws light on steps leading to the other. The bio-psychological study of individuals is a

key to the social/epistemological world of the disciplines; and vice-versa.

The requirements of the van Leer project allowed Gardner to expand from the limited theory of artistic development on which he had previously concentrated to a fuller account of the development of human intellectual competences as a whole. In doing so, he was able to retain the master-ambition that had motivated his work from his earliest days as a structuralist, bringing Piagetian insights into harmony with those of Lévi-Strauss: the desire to link biology and anthropology, to show that they are part of the same system.

# **3 FURTHER COMMENTS ON MI THEORY**

3.1 MI Since 1983

Since 1983 there have been two important modifications of MI theory.

3.1.1 The original seven intelligences have now been extended to include 'the naturalist intelligence' and—possibly—'existential intelligence' (1999a, Chapter 4). Naturalist intelligence is picked out by reference to a valued social role found across many cultures: people expert in recognising and classifying the varieties of plants and animals in their environment. Gardner tells us that 'those valued human cognitions that I previously had to ignore or smuggle in under spatial or logicomathematical intelligence deserve to be gathered under a single, recognized rubric' (Gardner, 1999a, p. 52). This seems to imply that, having reviewed the full gamut of intellectual activities, he realised that the taxonomic aspects of biology had been given short shrift in his original scheme.

This thought is reinforced by what he says in the same chapter on possible forms of spiritual intelligence and of existential intelligence—to do with 'big questions' about one's place in the cosmos, the significance of life and death, the experience of personal love and of artistic experience—as the strongest candidate among these (pp. 53–65). Religious and philosophical thinking are also parts of the intellectual world; and these, too, were ill-represented in the 1983 scheme.

All this lends strength to the suggestion that what powers MI theory is the drive to identify all major divisions of the intellectual life (taking the arts as always to be forms of knowledge). As should now be abundantly clear, the identification comes at the 'prerequisites' stage. Empirical evidence is not part of this story.

3.1.2 A second departure since 1983 has been Gardner's distinction between 'intelligence' and 'domain' (Gardner, 1999a, p. 82). The former is 'a biopsychological potential that is ours by virtue of our species membership'. The latter is a 'socially constructed human endeavor', for example 'physics, cooking, chess, constitutional law, and rap music'. It is

'characterized by a specific symbol system'. Gardner says he could have made this distinction more carefully in 1983. Readers would then have seen more clearly that several intelligences could be applied in the same domain, and the same intelligence in many domains.

This move detaches from each other the two dimensions, biological and social, that Gardner tried to hold together through his career. It makes MI theory unintelligible. For it has always been part of the concept of an intelligence that it is an ability that develops from a physiological origin towards an end-state belonging to a valued social activity. Poetry, music, the visual arts, dance, mathematics, logic, sport—the loci of the 1983 endstates—are all social constructions. Similarly, the idea of an intelligence was originally founded partly on the thought that symbols are bridges between the biological and the social. The 1999 version separates the previously inseparable and puts symbols and end-states firmly on the side of the social—as attached to *domains* rather than intelligences. At the same time, the 'criteria', which remain unchanged from 1983, include reference to both symbols and end-states among the distinguishing features of *intelligences*. This is why the 1999 version of MI theory is unintelligible.

# 3.2 MI and Education

Until the van Leer project Gardner was a psychologist, not an educationalist. But he had to adhere to the van Leer request that the Harvard research should 'assist educational policy and practice' (Gardner, 1983, p. x). In *Frames of Mind* Gardner 'touched on some educational implications of the theory in the concluding chapters. This decision turned out to be another crucial point because it was educators, rather than psychologists, who found the theory of most interest' (Gardner, 2003, p. 4). Since 1983 MI theory has had a huge influence on educational reform, especially school improvement, across the world. It has affected perspectives on pupils and their aptitudes, methods of learning and teaching, and curriculum content. If the argument of this essay is correct, all this has been built on flaky theory.

3.2.1 Gardner holds that while nearly all children possess all the intelligences to some degree, some of them have particular aptitudes in one or more of them. 'My own belief is that one could assess an individual's intellectual potentials quite early in life, perhaps even in infancy' (1983, p. 385).

It is not surprising that ideas like these have—not intentionally encouraged educational policies and practices to do with selection, specialisation, individualisation of learning, and assessment. But if the intelligences are not part of human nature but wobbly constructions on the part of their author, educators should treat them with caution. There may or may not be good grounds for personalised learning and other policies, but if they exist they must come from elsewhere. That teachers often need to vary the way they teach according to what best motivates particular pupils has been part of pedagogy for centuries; there is no good reason for confining this notion within the 'intelligences' framework.

3.2.2 There is abundant evidence that MI theory has been influential in reducing the low self-esteem of pupils who see themselves as stupid or thick, where this kind of judgment derives from conventional ideas of general intelligence based on IQ. The idea that intelligence is not necessarily tied to provess in logical, mathematical and linguistic tasks but can be displayed across a variety of fields is true—as our opening quotation from Gilbert Ryle illustrates. But the idea is not by any means original to MI theory (White, 1998a, pp. 3–4).

3.2.3 One reason why MI theory has been so influential may be its basis in supposedly discrete forms of intellectual activity—in Gardner's broad use of the term to embrace not only disciplines based on the pursuit of truth like biology and mathematics, but also the arts and athletics. With some exceptions, the areas it covers are close to those in a traditional socalled 'liberal education' based mainly on initiation into all the main areas of knowledge, to be pursued largely for their own sake. The addition of naturalist intelligence and (possibly) existential intelligence have made the fit even closer, seeing the affinities of these areas with biology and with work of a philosophical/religious sort.

On the whole, Gardner has refrained from deriving curricular consequences from MI theory. His writings on what the content of education should be show that the type of schooling he favours is in the 'liberal education' tradition: 'Education in our time should provide the basis for enhanced understanding of our several worlds—the physical world, the biological world, the world of human beings, the world of human artifacts, and the world of the self' (Gardner, 1999b, p. 158). He also thinks this understanding should be largely for intrinsic ends. He writes: 'I favor ... the pursuit of knowledge for its own sake over the obeisance to utility' (p. 39). This locates him firmly within the 'liberal education' camp, along with—in Britain—(the early) Paul Hirst, Richard Peters, Roger Scruton and others.

It is not surprising that Gardner's curricular ideas dovetail with his ideas of the intelligences, even if this was not his original intention. For the 'liberal education' tradition and MI theory share the same starting point. They both assume the importance in human life of intellectual activities pursued largely for their own sake. It is not surprising that educators reacting against recent utilitarian tendencies in schooling and looking for a more humane alternative have been attracted by MI theory, given its closeness to traditional 'liberal education'. But the latter idea is not necessarily tied to MI. Hirst, Peters and others have argued for it on quite other grounds (Hirst, 1974; Peters, 1966, Chapter 5). What is more, 'liberal education'—in this sense of intellectual learning for its own

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sake—itself needs justification. I have argued that this view does not hold water (White, 1982, Chapter 2; 2007). There is a danger that in basing children's schooling on it we are imposing a life ideal on them that *we*, as intellectually inclined people, may find personally appealing, but that, after all, is only one of many possible life ideals.

## 4 RESPONSE TO GARDNER'S CRITIQUE

The argument presented above is a streamlined, amended version of White, 2006, in which further refinements of it can be found. That book is a collection of papers on Gardner's work in general (not only in MI) and contains a chapter in which he replies to each author. In this final section, I outline Gardner's criticisms of my own paper (Gardner, 2006, pp. 295–7) and try to answer them. They nearly all apply to my arguments in this paper and I make clear where they do not.

### 4.1 Incommensurate Paradigms?

Gardner's first point is a general one:

Taking on a perspective which has its origins in Wittgenstein and has reverberation in more recent writings ... White questions my whole effort: it is hopeless, in his view, to try to place on a scientific basis distinctions and categories that essentially grow out of our language, our ways of talking and conceptualizating (*sic*). If I am right in my characterization of White, there is no way that I could satisfy him. In the phrase made famous by Thomas Kuhn (1970), we are proceeding from 'incommensurate paradigms' (Gardner, 2006, p. 295).

Gardner concludes 'that there is no bridge between us'. But I think he is wrong about this. It is not that he works with one paradigm-empirical science-and I work with an incommensurate one-'linguistic philosophy' perhaps. I am quite comfortable with treating intelligence as a topic for scientific investigation. Other animals besides human beings can act intelligently, and it is a matter of empirical enquiry to examine such behaviour, for instance, in different species. There can also be scientific investigations of intelligence-or, if you prefer, intellectual abilities-in human beings. One might compare, for instance, the mathematical competences of girls and boys of the same age and social background. In my paper, although sceptical from the start, I have been prepared to go along with the suggestion that there is a scientific way of categorising intellectual abilities. I have taken seriously Gardner's attempt to do this and examined the main stages of his argument in some detail. My conclusion is that he has failed to make his case. It is not that Gardner is working within science and I am rejecting science. It is questionable, indeed, as I have shown in some detail above, whether at the crucial turning points of his system-e.g. in the 'prerequisites', and in how the

'criteria' are to be applied—Gardner operates as a scientist at all. Gardner himself casts doubt on the scientific nature of his procedure in his admission, worth quoting again here, that 'At present, however, it must be admitted that the selection (or rejection) of a candidate intelligence is reminiscent more of an artistic judgment than of a scientific assessment' (Gardner, 1983, p. 63).

# 4.2 Gardner's Four Specific Responses

After this first comment of a general sort, Gardner goes on to make four specific responses.

4.2.1 End State (p. 295) Gardner says that 'as a developmentalist, I believe that one cannot study an area without having some sense of what it is like in its full-blown form', but that 'this delineation of an end-state need not at all be fixed or frozen' (ibid.) This is a useful elucidation of his position, but I do not see it as at odds with what I wrote, since I agreed in my discussion of developmentalism that some people may argue that the development of intelligence does not necessitate intellectual ceilings.

4.2.2 Criteria for Criteria (p. 296) Gardner makes several points about criteria for criteria.

### 4.2.2.1 He writes:

White asks, with reference to my criteria for an intelligence, from what source do they emanate? As I explained above, they represent my effort to incorporate the principal disciplinary strands that are relevant to any examination of human cognition. My response to White: The search for criteria for an investigation opens up the possibility of an infinite regress. If he puts forth criteria, I can simply respond by asking him for the criteria for those criteria. I see my list as an entirely reasonable first pass; the proper response would be to suggest an alternative set of criteria, and to show that they are better motivated or less problematic for the task at hand.

I suppose the point about an infinite regress is that if one asks for good reasons for something, one can ask for good reasons for relying on those good reasons, and so on. I don't see an infinite regress necessarily opening up here. In any intellectual dispute some things are going to be taken for granted, otherwise no discussion would get off the ground. But Gardner's main response to my request for a justification for these particular eight criteria is that they 'incorporate the principal disciplinary strands that are relevant to any examination of human cognition'. I do not think they do. There is no philosophical or historical criterion, for instance. 'Susceptibility to encoding in a symbol system' hardly indicates a 'principal disciplinary strand': it is so obviously tied to a particular, and not widely accepted, approach to aesthetics associated with Goodman and

behind him Cassirer and Langer. The criterion to do with development, likewise, is tied to a highly controversial perspective on the acquisition of competencies.

These two examples—and I could adduce others—reinforce the point I made in the paper, that the only way of understanding why Gardner proceeds as he does is via the contingencies of his biography (perhaps Goodman's happening to be at Harvard at the same time as Gardner, for instance?). Gardner himself in the above quotation talks of the 'sources' from which the criteria emanate. But explanation is different from justification, and it is lack of justification that I was criticising in the paper, not provenance.

4.2.2.2 Gardner takes exception to my claim that 'mathematical abilities are, to a large extent, a specialized kind of linguistic ability'. I claimed this in the original paper (p. 47)—but not in this version—as a challenge to Gardner's view that the intelligences are 'relatively autonomous competences' (1983, p. 8). In his reply, Gardner says that 'the statement is not one that can be established by authority; it is an empirical issue'. But these are not the only two possible kinds of backing. There is also *a priori* argument. I have in mind the definability of many if not all mathematical terms, 'prime number', for instance, 'x', ' $\pi$ ', etc. in simpler terms familiar, ultimately, in ordinary language. Someone with a deep understanding of mathematical concepts has a deep understanding of a certain sort of language.

4.2.2.3 With regard to the criterion to do with *idiots savants* (etc.), Gardner objects to my describing the architectural drawing of autistic artist Stephen Wiltshire as 'subnormal mental facility'. Gardner replies that many knowledgeable observers hold his gift in high esteem. I do not doubt that people marvel at it. I called it 'subnormal' because—if I'm right—it 'is a *mechanical* facility, one that lacks the flexibility of adapting means to ends found in intelligent behaviour'.

4.2.3 Domains and Intelligences (p. 296) Gardner says that I 'completely misconstrue' this distinction. 'Far from making my theory "unintelligible", this terminological shift has clarified what I have always sought to do'. But I cleave to the charge of unintelligibility. For something to be an intelligence, it must pass the 'prerequisites' test. That is, it has to be a valued social activity of some sort. But according to Gardner's distinction, it is *domains*, not intelligences, that are social constructions, while intelligences are biopsychological potentials. So intelligences both are and are not social constructions. That's where the unintelligibility resides.

4.2.4 Educational Implications (p. 297) Gardner dismisses my suggestion 'that MI-inspired classroom practices are necessarily ill-advised'. Many practitioners do feel the theory is helpful; and there is empirical evidence that MI-inspired practices can be productive.

Suppose both these latter things are the case, would it matter if the theory behind the practices were shown to be untenable? And would it matter if practitioners rightly believed it to be untenable? Some people,

e.g. Phil Beadle, would say no. Writing about my critique of MI theory, Beadle balks 'at any suggestion that schools should throw out effective practice because it is built on sand' (Education Guardian, January 17, 2006). This raises the question 'How much does truth matter?' Sometimes in life, saying or acting on what one knows to be untrue may be justifiable. Truth may be of less high a priority than, say, concern for another's welfare—as in the often-cited case of lying to someone intent on murder about the whereabouts of the victim. A consideration here is that it is a teacher's professional duty, among other things, to steer learners away from what is false and ill-founded to what is true and well-founded. I did not in fact write that MI-inspired practices are 'necessarily ill-advised', but that educators should treat the intelligences 'with caution'. Maybe there are circumstances when teachers are justified in lying. Maybe it is all right to tell a child that she comes up high on spatial intelligence, even though one thinks there's no such thing: perhaps this gives her a lasting motivational boost. But at the very least, the teacher should make the truth clear to the student at some later point. It would be even better to give her the boost in a way not dependent on MI theory but on what is true. 'That's brilliant, Caitlin. I really like your plan (for a house). And you always tell me you're thick! It just brings home, doesn't it, that there are so many different ways in which people can be clever. You're a star!'.

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#### ACKNOWLEDGEMENTS

This paper is a much shortened, amended version of my essay 'Multiple Invalidities' (White, 2006). My 'Response to Gardner's comments' was also absent, of course, from the original paper. I am most grateful to Jeffrey Schaler for allowing me to publish this new version of the paper in the present volume. I am also indebted to the following UK teachers for information about how MI theory has been applied in their schools: Margaret Grant, Deputy Headteacher of Broughton Hall School, Liverpool; and James McAleese, of Richard Hale School, Hertford.

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