

Baggage Even When the Planes Don't Land: Multiple Intelligence Theory as a Cargo Cult.

By Philip Freeman, Los Altos Institute Fellow

Abstract

As a field, education is prone to accepting theories of pedagogy without what a scientist would consider adequate critical analysis. Howard Gardner's theory of multiple intelligences, as one example, has had tremendous impact in education and is widely and uncritically accepted within this field, in part because of the belief that it is supported by scientific research and in part because it resonates with the prior beliefs of educators. A closer examination shows that as a scientific theory MI is unsupported and almost certainly false, and that its function is not as an explanatory theory but as a taxonomy of cognitive processes. As such it is heavily value and culture-laden, and using it as the basis of our pedagogy embeds these values into the 'hidden curriculum' of our teaching in ways that the author considers problematic.

Education and Cargo Cult Science

In a commencement address at MIT in 1974, the physicist Richard Feynman described what he termed "cargo cult science" – the way in which some groups and institutions adopt the outward form of science (as the cargo cults in the south seas imitate the forms of airfields and traffic control equipment to try to make planes with cargo come to them) but miss the essence of science, which he felt was "a specific, extra type of integrity that is not lying, but bending over backwards to show how you are maybe wrong"¹.

Feynman felt that many fields failed to make significant progress because of a failure to do this. They might formulate theories or even do experiments, but these had little value if they were not rigorously tested and honestly and fearlessly evaluated. "So I call these things cargo cult science, because they

¹ Richard Feynman, "Cargo Cult Science" in *Surely You're Joking Mr. Feynman* (New York: Norton, 1985), #.

follow all the apparent precepts and forms of scientific investigation, but they're missing something essential, because the planes don't land. " As one of his examples of such cargo cult science he used the field of education.

I entered education, after my initial training as a physicist and mathematician, about 20 years ago, and I found the transition a shock for this very reason. I was trained to ask 'What is the evidence for this theory?' and 'What predictions of this theory have been tested, and how well do observations fit the predictions compared to other theories?'. Not only were we not shown such evidence, when I asked about it my professors did not know the answers, nor even how to find such answers. As presented the educational theories we were given to guide our practice were very much examples of Feynman's cargo cult science.

Now, roughly forty years after his speech, the criticism is no less applicable. As a teacher I am frequently provided with encouragement and advice from educational leaders who care deeply about education and "best practices". They advocate this or that 'new' approach to pedagogy... all of them described as "scientific" and, almost without exception, cargo cults.

One can argue that this lack of rigour is inevitable, given the complexity of human beings compared to the simple systems physics studies, and there is much truth in this. But the failure to critically examine the 'theories' which inform our teaching has many negative effects, both hampering our ability to improve our pedagogy and altering what and how we teach in ways that carry assumptions about educational and human values which we would be well to examine. This is especially true when these theories bill themselves as scientific, because in doing so they claim a level of objectivity which may make us even less likely to examine the baggage that these 'theories' carry.

In particular I am struck by one of the most popular recent approaches to pedagogy, which styles itself as “Brain Based” Education, and which purports to bring the results of modern neuroscience to bear on the field. Conferences are held² (a significant for-profit business) and many books published about how brain science can improve our teaching³ (mostly, it appears, by doing what already existing ideologies of education have been advocating for generations). Unfortunately the exact connection between what science is finding out about the brain and how to educate are far from clear, and certainly not direct. As John Bruer points out: “there have been numerous books, journal articles, policy studies, and stories in the media about how our emerging understanding of brain development and neural function could revolutionize educational practice. Neuroscientists [...] are more guarded in their claims. Often they are puzzled by the neuroscientific results educators choose to cite, by the interpretations educators give those results, and by the conclusions educators draw from them.”⁴ I share Bruer’s skepticism. Despite teaching for almost 20 years I have yet to see a student’s brain in my classroom, and (barring some very radical changes in technology and paradigm) I rather fervently hope never to do so. While I certainly acknowledge that knowing about the brain’s function is deeply important, and while I also acknowledge the importance of reductionist methods in scientific understanding, I am also well aware of the distance between an understanding of underlying laws and working technologies. There is a reason that engineering is a separate discipline from theoretical physics.

² A few of the more prominent organizations who run conferences in this area are “Learning and the Brain” (<http://www.learningandthebrain.com/>), “Jenson Learning” (<http://www.jlcbrain.com/>). Many associations also run conferences. My own school district has an annual conference “Teaching with the Brain in Mind” (<http://public.sd38.bc.ca/Learning-BrainWeb/>).

³ For example T. Tokuhamma-Espinosa, *Mind, Brain, and Education Science*, (New York: WW.Norton & Co, 2011); or, more historically, G. Cain, and R. Cain, *Making Connections: Teaching and the Human Brain*, (Alexandria, VA: Association for Supervision and Curriculum Development, 1991).

⁴ J. Bruer, “Education and the Brain: A Bridge Too Far” *Educational Researcher*, 26.4, 4. ,

The Theory of Multiple Intelligences

The concept of intelligence has been intertwined with the field of education since the first IQ test was designed by Binet to detect learning disabilities. The idea of a single, “general intelligence” has some support in research, but it is also one that has done much harm, often being used to justify the oppression of people and destruction of lives. A vivid and scholarly account of the history of the misuse of intelligence can be found in Steven Jay Gould’s book *The Mismeasure of Man*⁵. Many people quite naturally have questioned whether intelligence can be defined or measured at all, or whether such attempts are inherently counter-productive. Others have sought to broaden the idea of ‘IQ’ to examine it as something other than a single scale.

In this tradition, one of the most pervasive ideas that has entered education under the banner of brain-based education (though now often disavowed) is the theory of multiple intelligences, developed by Howard Gardner of Harvard University.

Gardner noted that victims of brain damage due to stroke or trauma might lose, not all cognitive abilities, but a subset. Similarly some individuals (savants) may have one or more cognitive abilities to a remarkable degree while being of lesser ability in other cognitive areas. This, together with the established principle from evolutionary theory that complex systems developed by natural selection tend to be modular in nature, lead him to conclude that human intelligence was not unitary but should consist of a number of separate and distinct systems, which he defined to be separate intelligences. While Gardner recognised that others have provided classifications of these intelligences before, but saw these as of lesser value because they represented structure imposed *a priori*.⁶ He attempted to

⁵ Stephen Gould, *The Mismeasure of Man* 2nd Ed. (New York: W W Norton & Co, 1996), passim.

⁶ H. Gardner, “What is an Intelligence” in *Frames of Mind: The Theory of Multiple Intelligences* 3rd Ed. (Philadelphia: Basic Books, 2011), #.

identify these “a posteriori” by a number of criteria based on observation. He recognised certain criteria for designating an ability as an intelligence:⁷

- 1) Potential isolation by brain damage
- 2) The existence of Idiots Savants, prodigies and other exceptional individuals
- 3) An identifiable core operation or set of operations
- 4) A distinctive developmental history, along with a definable set of expert “end-state performances”
- 5) An evolutionary history and evolutionary plausibility
- 6) Support from experimental psychological tasks
- 7) Support from psychometric findings
- 8) Susceptibility to encoding in a symbol system⁸

Based on this set of criteria, and the framing prerequisite that the set of intelligences should “capture a reasonably complete gamut of the kinds of abilities valued by human culture” Gardner identified seven intelligences initially:

- 1) Linguistic Intelligence
- 2) Musical Intelligence
- 3) Logical-Mathematical Intelligence
- 4) Spatial Intelligence
- 5) Bodily-Kinesthetic Intelligence
- 6) Interpersonal Intelligence
- 7) Intrapersonal Intelligence

In 1993 Gardner re-examined his theory, considering possible additional intelligences and adding an eighth while rejecting (or sitting on the fence about) several other candidates.

- 8) Naturalist Intelligence⁹

⁷ Ibid., #.

⁸ Ibid., #.

⁹ H. Gardner, *Frames of Mind: The Theory of Multiple Intelligences* 1st Ed. (Philadelphia: Basic Books, 1993), #.

It is important to note that Gardner intended MI theory as more than a description, but as an explanation for how the brain and intelligence works. We will see that MI has had extremely significant impact on teaching, but its reason for being is to explain psychological and biological phenomena, and its claim to application must rest on whether it in fact does so.

I will have more to say on this later, but first let us look at the reception of the theory.

Impact of MI Theory in Education

MI Theory has had enormous impact in the field of education – vastly more than in the fields Gardner says it was developed for. Indeed MI has had negligible effect in the fields of cognitive psychology and neuroscience. In her analysis in 2006 Lynn Waterhouse concludes that “there are no publications from cognitive psychologists, cognitive neuroscientists, or evolutionary psychologists to suggest that they have conducted research directed at defining or validating Gardner’s intelligences.”¹⁰

In the field of education, however, it is another story. A quick search of one of the major databases for papers in education, the Education Research Information Centre (ERIC) shows 1438 results with the keyword “Multiple Intelligences” as of January 2013. Gardner and others note that “Many hundreds of schools across the globe have incorporated MI principles into their mission, curriculum, and pedagogy; and hundreds of books have been written (in numerous languages) on the relevance of MI theory to educators and educational institutions.”¹¹ Teacher training programmes often assume MI theory as a given. Here in BC, official Ministry of Education standards, such as the Primary Program Framework and the BC Literacy Plan, include Gardner’s multiple intelligences as part of required teacher guidance¹² and the subject occurs frequently in the discussions on personalized learning as part of the

¹⁰ Lynn Waterhouse, “Inadequate Evidence for Multiple Intelligences,” (*Educational Psychologist* 41.4): 210.

¹¹ J. Cristodoulou, K. Davis, H. Gardner, S. Seider, “The Theory of Multiple Intelligences” in *The Cambridge Handbook of Intelligence* S. Kaufman and R. Sternberg, eds. (Cambridge: Cambridge University Press, 2011), 486.

¹² *Primary Program Framework*, (Victoria: BC Ministry of Education, 2000), 39, 51,71.

new “BC Education Plan”. Even the Canadian Broadcasting Corporation has gotten into the act – the upcoming programme “Canada’s Smartest Person” will assume MI Theory!¹³

Most of these applications of MI Theory are not critical, accepting the theory as a given. For example of the 130 articles ERIC lists with the key word “Multiple Intelligences” during the last three years, all but 5 simply assume MI Theory as the basis for their design or analysis. It seems to be taken for granted by most of those in education that the theory is a given.

It is clear that the theory of Multiple Intelligences has had a significant impact, and is shaping many people’s understanding of intelligence and education. But is the importance given the theory justified in Feynman’s sense? Is Gardner’s explanation of how the mind works equally successful as a scientific theory?

Testing MI Theory

The definition of a theory in science is by no means unambiguous, but it would be fairly universally acknowledged that Carl Popper’s assertion that a scientific theory must be *falsifiable* (must have some test that would show it to be false) is generally held up as one criterion that must be met. To fully escape Feynman’s label of “cargo cult” Gardner should observe that “bending over backwards to show how your theory might be somehow wrong” which Feynman advocates. Among other things Gardner should be seeking and explaining what observations would show his idea is wrong.

It might at first appear that he does so. Gardner does not immediately offer testable predictions, but he is well aware of the need for disprovability and agrees that “...it seems opportune to indicate the conditions under which the theory could be disproved. After all, if MI theory can explain (or explain

¹³ “Canada’s Smartest Person” last accessed 28 January, 2013, <http://www.cbc.ca/smartestperson/multiple-intelligences.html>.

away) all potentially disconfirming evidence, it is not a valid theory in the scientific sense of the term.”¹⁴

However, in the section that follows Gardner, though he asserts that he is outlining the conditions that would disprove his theory, in fact avoids the word ‘disprove’ almost entirely. He suggests situations under which the theory might need to be “revised”, or “revamped”. Short of a complete change of paradigm eliminating the whole concept of intelligence, however, he does not suggest what would cause one to abandon the theory as false.¹⁵ In a later work he suggests “Suppose the researchers discovered... that a certain brain region in fact subserved more than one intelligence... or that symbol systems ostensibly associated with one intelligence actually drew on the same cognitive processes as another intelligence. Each of these lines of evidence would cast doubt on the validity of the overall theory, though the theory might continue to be valid if appropriately revised.”¹⁶

Lynn Waterhouse, reviewing MI theory in light of neurological research and emerging theories about how the brain processes information and decision-making finds exactly the sort of evidence that Gardner suggests would “cast doubt” on the theory (which seems to be as close as he is willing to come to “disprove”). She concludes simply that “the empirical evidence reviewed here does argue that the human brain is unlikely to function via Gardner’s MI.”¹⁷ Her final evaluation is that “MI theory should not be taught without consideration of the absence of empirical validating evidence for MI theory or without consideration of alternate evidence-based models of human cognition”¹⁸

What Waterhouse asserts is precisely what Gardner says would be a disproof of his theory – that human thinking is better explained using alternative theories, and that the same neural pathways serve

¹⁴ H. Gardner, *Frames of Mind* (1993), #.

¹⁵ Ibid.

¹⁶ H. Gardner, *Intelligence Reframed: Multiple Intelligences for the 21st Century* (Philadelphia: Basic Books, 1999), 98.

¹⁷ Waterhouse, “Inadequate Evidence,” 212.

¹⁸ Ibid., 213.

what he describes as different intelligences – indeed that the evidence suggests “the direct opposite of the basic operating plan theorized for the MI. Each multiple intelligence is a multipurpose processor that operates on a single content. Conversely, [identified neural] pathways are unipurpose processors operating on a[sic] multiple contents”¹⁹

A theory is a theory because it explains what we observe. In this case MI fails to explain, and what we observe seems to be incompatible with it. As a scientific explanation for how the brain works it seems clear that “serious doubt” has been cast. This, however, is not the response of Gardner and his school. His response to Waterhouse’s evaluation is to categorize her view of science as “naïve”²⁰ because she expects scientific theories to be testable by experiment. His work is synthetic, and therefore not testable in this way. Indeed Gardner has rejected the possibility of such testing previously: “I have never felt that MI theory was one that could be subjected to an “up and down” kind of test, or even series of tests.”²¹

Now, it is certainly true that science is a complex activity and involves a great many approaches. But I think that Gardner’s reluctance to allow the possibility of disproving his theory, as shown by both his assertions of its not being disprovable by tests and his avoidance of the possibility of outright disproof even while insisting that it is a proper and falsifiable theory, is precisely what Feynman meant when he talked about education research as being “cargo cult science”. He also held to the idea that things must be testable, and that they must make testable predictions. Gardner would very probably hold that Feynman’s insistence that these criteria should apply to all would be sciences as just as naïve as Waterhouse.

¹⁹ Ibid.

²⁰ H. Gardner and S. Moran, “The Science of Multiple Intelligences Theory: A Response to Lynn Waterhouse”, *Educational Psychologist*, 41.4: 239.

²¹ H. Gardner, *Frames of Mind* (1993), #.

Is MI Theory a theory at all?

If we accept the analysis of Waterhouse and others then by at least some standards of science, MI theory (along with quite a number of other educational theories) is pseudoscience, or at the very least “cargo cult science”. To whatever extent it is falsifiable I conclude that the theory is false.

Indeed not only is MI unsuccessful in explaining how the mind works, I would argue that it is wrong to regard MI Theory as a scientific theory at all. What makes a theory a theory is that it *explains* observed data in terms of underlying entities and mechanisms. MI does not do this. Indeed the phenomena of intelligence are generally held to be better explained by some combination of a general factor (usually termed “*g*”) and numerous very specific functional modules. In response to this criticism Gardner seems to claim quite a different status for his ‘theory’ when he writes that

I have never denied the existence of “*g*” [general intelligence...] If one is conducting a certain kind of factor analysis one will come up with a measure like “*g*”. By the same token, I go on at great length in *Frames of Mind* [...] to illustrate that each intelligence is itself composed of many subintelligences which may, *a la* Fodor [who proposed many small-scale modular components of human intelligence] operate in modular fashion, and I indicate that one may be strong in one subintelligence... while not being as strong in another... The question then is not ‘one intelligence or dozens of subintelligences.’

Rather, the question is: ‘Under which circumstances does it make most scientific sense to invoke concepts at these different levels of analysis?’²²

Expressed in this way it seems that Gardner is not proposing an explanatory theory – he is creating a *taxonomy*. He acknowledges a ‘fine-grained’ modularity (which there is evidence for) and an over-

²² H. Gardner, “A Reply to Perry D. Klein’s ‘Multiplying the Problems of Intelligence by Eight’” *Canadian Journal of Education / Revue canadienne de l’éducation* 23.1, 1993: 97.

arching commonality (which there is evidence for), but believes that an intermediate level of classification is useful and important.

We see a similar classification structure in zoology, where individual species are combined into larger groups according to the well-known Linnaean system of species, genus, family, order, class, phylum and kingdom. The organization of animals in this way is indeed useful for biologists. But it is also a cultural structure, not in itself a scientific one. Steven Jay Gould argues that “Biologists argue that only species are real units in nature, and that names at higher levels of the taxonomic hierarchy represent human decisions about how species should be grouped... Thus, for names applied to groups of species [by other cultures] we should not expect one-to-one correspondence with Linnaean designations but should anticipate a variety of schemes based upon local uses and culture.”²³ He uses as an example the Kalam of New Guinea who divide non-reptilian vertebrates into classes based on whether they are hunted for food, and if so whether hunted by men or women. Thus frogs, marsupials and rodents are one class, large rodents and game animals another and so on. The way the species are grouped reflects the culture doing the classifying. One finds similar cultural dependence in the classification of what we might be tempted to term “more sophisticated” cultures (or at least ones more similar to ours) as well. In China (before modern science enters) there were a number of classification systems for living things, but they did not resemble Linnaean ones. Rather than morphology their classifications were based on the graphs used to represent the animal names, their ritual and moral significance, or their resonances with the 5-element world-system²⁴. I am reminded of Borges’ (probably apocryphal)

²³ S. Gould, “A Quahog is a Quahog” in *The Panda’s Thumb* (New York: Penguin Books, 1980), 210.

²⁴ R. Sterckx, “Animal Classification in Ancient China” *EASTM* 23 (2005): 26-53.

Chinese taxonomy in his essay “The Analytical Language of John Wilkins”, itself an exploration of the arbitrary nature of classification.²⁵

Given that classification is a representation of how we think about and analyse the world, and not a representation of what is in the world, it is not really correct to ask “Is the classification true?”²⁶. The question, as Gardner himself indicates in the quote, is whether the classification is useful. And, I would add, “What assumptions are embedded in the classification?” since taxonomies are culture-laden. This last is my greatest concern in the adoption of MI Theory as a guide for education. In recognising that multiple intelligences are not a theory describing the world, but a classification scheme describing one way to think about the mind, we should also recognise that MI Theory is a statement of ideology.

Is MI Theory useful?

Some may argue that before asking what is assumed by MI we should ask whether it actually works... is it a useful taxonomy? Perhaps, as defenders of the multiple intelligences theory assert, the theory is vindicated by its results in application. Supporters of MI theory argue that “the educational literature is

²⁵ The list was ‘discovered’ by Borges in a translated Chinese encyclopedia. Borges frequently invented scholarly references, so this list is likely created by him. Nevertheless it has had a great deal of influence in shaking people’s view of taxonomy, most notably Foucault’s. I reproduce it here in the same spirit:

A Classification of Animals:

- 1) Animals belonging to the Emperor. 2) embalmed ones, 3) those that are trained, 4) suckling pigs, 5) mermaids, 6) fabulous ones, 7) stray dogs, 8) those included in the present classification, 9) those that tremble as if they were mad, 10) innumerable ones, 11) those drawn with a very fine camelhair brush, 12) others, 13) those that have just broken a flower vase, 14) those that from a long way off look like flies.

Borges, J L “The Analytical Language of John Wilkins”, Selected Nonfictions, ed. Weinberger, E; Penguin Books, 2000 p. 23`

²⁶ Note that I am sure, from his comments, that Gardner would insist on his system being a theory with a truth value, and that the divisions he sees are not arbitrary, although having subjective components. His description of his categories as occupying a middle level of analysis and his invocation of utility in justifying this level, however, places them firmly within a taxonomic framework. Taxonomies can unveil non-arbitrary structures (as the Linnaean system helps show evolutionary kinship) but this is not the origin or main function of such systems.

replete with examples of individual schools and teachers who have shared in different ways their successes in implementing MI theory."²⁷

This claim, that MI Theory that is of pragmatic usefulness to educators, might be taken as a justification of its use. If, to return briefly to Feynman's criticism, the planes really *do* land, then perhaps any criticism of the theory as a 'cargo cult' misses the mark.

Gardner, for example, argues this in his reply to Waterhouse. In particular he cites a study by Kornhaber et al which "documents numerous ways—quantitative as well as qualitative—in which these schools and their students have benefited."²⁸ However, as Kornhaber reports in describing the study: "this sample was culled from an initial population of over 60 schools that had either contacted Gardner with reports that MI was beneficial or that had been referred by consultants who felt that MI was working well in those schools "²⁹ Kornhaber clearly feels that MI is being useful in these schools, but a sample selected in this way, while documenting ways that these schools felt the theory was helpful, cannot be used as evidence for the general effectiveness of MI.

Many Researchers are, in fact, sceptical about the effectiveness of MI. A review article by Roger Wilson states simply "Research evidence does not support the effectiveness of adapting instructional strategies to students' learning styles or their so-called multiple intelligences [...] Researchers are rather unequivocal in stating that those particular "brain-based" strategies do not work as purported."³⁰

²⁷ T. Armstrong, *Multiple Intelligences in the Classroom*, 3rd Ed., (Alexandria, VA: Association for Supervision and Curriculum Development, 2009), 195.

²⁸ H. Gardner, [which work?] (1998), 229.

²⁹ Kornhaber, M. "Multiple Intelligences: From the Ivory Tower to the Dusty Classroom-But Why?" *Teachers College Record* 106.1, 2004: 71.

³⁰ Roger Wilson, "The Emperor's New Clothes: Learning Styles and Multiple Intelligences," *Colleagues* 8.2 (2012): #.

If MI Theory is, in fact, both wrong about how the brain works and not demonstrably useful to teachers, why has it found such a high level of acceptance by educators?

MI Theory's Appeal in Education

To understand the acceptance of MI we need to look at factors other than its truth or utility, and return to MI as an ideology.

Kornhaber's study actually identifies five key elements in those schools that do view MI as successful for them. The first three concern the fact the MI (as an ideology) was in accord with the existing beliefs of teachers:

- 1) *"MI validated what educators already know. Educators' everyday observations were already aligned with the theory's idea that people learn in a variety of ways."*
- 2) *"MI complemented educators' existing philosophies and beliefs. For example, MI aligned well with constructivist and progressive philosophies"*
- 3) *"Educators already used some practices that fit with the theory. These included project-based curriculum, arts-integrated approaches, thematic units, learning centers, and hands-on learning..."*

I am a fan of many of these approaches myself – but the fact that the theory confirms existing practice does not seem to me to be necessarily a positive reflection on the theory. Rather than providing new approaches MI is used to justify what people already wished to promote. This could be taken as a corroboration of the theory. But it could also be taken as a failure of the theory to lead to any new understanding or predictions, and leave the theory as just extended confirmation bias.

The last two reasons for adopting the theory affirm that it is, in fact, a taxonomy:

- 4) *"MI provided a framework for organizing educators' practice. Teachers, like skilled practitioners in other disciplines, have a large repertoire of knowledge and methods that they draw on intuitively [...] MI offered teachers a handy way of categorizing and understanding the contents of their repertoire."*

- 5) “Educators reported that MI helped extend their practice. When a closet organizer is put in place, it is possible to see more clearly both what has been categorized and also what is missing.[...] In effect, MI provided educators with a framework that supported systematic reflection on, and development of, their practice.”³¹

What this shows is that, as a taxonomy, MI is indeed useful for some teachers. However if its adoption is based on fitting pre-existing beliefs then its utility for the purpose it claims, that of improving student’s learning, is involved only in a secondary role (MI is adopted because it supports teachers’ existing praxis, which the teachers chose because they believed it to be best for supporting student learning). If the teachers are correct then MI does not make them more correct, and if they are mistaken then MI will not show them this fact. It is not at all clear if MI is actually being useful in either case.

Kornhaber does indeed show some schools did change their practice... though again the sample studied was chosen with an eye to studying positive outcomes, not determining if positive outcomes were caused by adopting MI: “The three sites in the sample were selected because they provided a ‘best case scenario’ “³² as privileged schools without challenges due to funding or demographics. It is not clear that even a careful study of 3 carefully chosen schools who were already self-identified as having had success in changing their practice, are meaningful in evaluating the effectiveness of the theory as translated into pedagogy. To use the paradigm of science that Gardner takes issue with, it is the farthest thing imaginable from a controlled study.

This then suggests why Gardner can have such a different view of the effectiveness of MI within education from other researchers. By focussing on successful cases researchers such as Kornhaber may

³¹ Kornhaber, M. “Multiple Intelligences: From the Ivory Tower to the Dusty Classroom-But Why?” *Teachers College Record* 106.1 (2004): 68-69.

³² *Ibid.*, 69.

gain insight into what makes some schools believe their implementation of MI is successful, but they cannot evaluate whether MI leads to success in general.

What Kornhaber's studies show, it seems to me, is that MI succeeds mainly in affirming the pre-existing beliefs and practice of a certain school of teaching. For what it is worth I am quite sympathetic to this school and my own teaching is influenced by it. But I recognise that my choices are based on what I find personally helpful and congenial – on what I wish to be true, not what I know to be true. This seems to be the case with MI... with the addition of implicit assumptions within the theory which I perceive as actually problematic. The advantage of theories which emerge from and are tested by evidence is that they challenge our existing preconceptions and broaden our ideas and understanding. A theory which does nothing but confirm our views, and which is formed out of them, is likely to do the opposite.

MI in Practice

The idea of MI Theory as a taxonomy and "closet organizer" which is congenial to a certain view of education is borne out by my discussions with my own administrators during the writing of this paper.

The two administrators I spoke with are both very dedicated and supportive educators, keen on promoting student learning and well-being and on supporting teachers. Both are extremely well educated and involved in ongoing discussion of teaching.

Both were surprised by my claim that, as a theory, MI was not scientifically proven, and in fact not supported by evidence. Both affirmed that their own experience of MI theory in educational settings was not as a theory of cognition but as a matter of "learning styles" (a use of the theory which Gardner recognises but considers a misapplication of the theory³³).

³³ H. Gardner, *Frames of Mind* (1993), 83-84.

They saw the value of MI as, first, promoting differentiated instruction, which they were confident led to better student outcomes. Secondly, and related to the first, they saw MI as providing for diversity within the classroom, and as affirming the value of students who might have felt marginalized within a more traditional view of 'intelligence'.³⁴

This last aspect is common among teachers I talk to. As humans we want to believe that the world is fair, and as teachers we want to value and support all of our students. The idea that there are many different intelligences means that we are now able to find strengths in students where we might not have acknowledged them before, and even to imagine that every one of our students is intelligent in *some way*.³⁵ This desire to affirm every student can, of course, backfire... one of my students once somewhat cynically quoted "Always remember that you are unique and special – just like everybody else."³⁶

Another individual whose experience of MI Theory I queried is Dr. Robert Runté, who teaches both student assessment and sociology of education at the University of Lethbridge. I asked what his students were taught about MI Theory.

"[...]there is a chapter in the textbook used in the mandatory assessment course devoted to Gardner's theory of multiple intelligences. I do not include that material in my own lectures, except perhaps for the occasional disparaging aside, but the text was required reading for all students until this year. I think the reason Gardner is so popular with instructors is that the idea that people learn differently--and that schools reward some kinds of thinking while penalizing others--is a new thought for most student teachers, and that they will likely be better teachers if they are open to a variety of learning/teaching styles."³⁷

³⁴ I am grateful to my administrators, Rose Seblin, principal and Gordon Fitt, vice principal at Richmond Secondary School, Richmond BC for sharing their thoughts and experience, on this occasion as on many others.

³⁵ Ref on Just World.

³⁶ I have not found an attribution for this, though it is apparently sometimes misattributed to Margaret Mead!

³⁷ R. Runté, personal communication, January 7, 2013.

Here again the pragmatic usefulness of MI as a classification system for thinking about intelligence is being affirmed, within the context of diversity and learning styles. I can respect such a choice, and all teachers know that sometimes we need to use models that are incomplete or flawed to help students understand a complex topic.

Nevertheless I feel that as educators we are guilty of a serious mistake when we accept expediency over truth. In adopting ideas because they fit with, and support, our own experience and theories of teaching, or because they have useful side-effects, we fall far short of Feynman's "honesty" with ourselves, about showing how our theories might be wrong.

Were it not for the scientific trappings of MI theory we would never tolerate such arguments. I cannot imagine that anyone would argue that it would be good, in order to differentiate instruction, to teach students differently based on their sign of the zodiac, or by doing a tarot reading prior to each term.

Why should we view differentiation based on a classification such as MI as particularly better, if it is also not scientifically supportable? Granted we have evidence that some individuals find it useful. But there are people who find astrology or tarot quite personally helpful, and I would not wish to disparage that – I just think we shouldn't build our educational praxis on it.

I agree with Feynman that our willingness to accept flawed theories as the basis for our practice is one reason (though only one of many) that "the planes don't land" and education does not develop as the sciences have. Without a higher standard of rigour I do not see much hope for improving on that track record.

I would argue, therefore, that one reason we should not embrace MI theory in education is that it is arguably false and it may prevent the emergence of better models.

The Cultural Assumptions of MI

Beyond the simple fact that MI does not work, however, I think there are some deeper issues around adopting MI as a guiding principle ... systematic issues which are worse than just failing to achieve progress in our educational practices, but which may be moving us in directions that are undesirable in themselves. These issues derived from the cultural assumptions in the way MI is created, and the deeper assumptions in the enterprise itself.

As teachers we are conscious of what is sometimes called “the hidden curriculum”, the ideals and beliefs that we teach without even being aware that we are teaching them³⁸. MI Theory attempts to define itself in somewhat objective terms by the use of its criteria, but because it is taxonomic and synthetic there is a value judgement made in what things are held up to those criteria. Like all taxonomic systems MI reflects the perspective and priorities of its creator.

This can be seen in what things are held to qualify as ‘intelligences’ and which things are ‘subintelligences’ to use Gardner’s phrase. For example the recognition of faces is a human ability which certainly meets all the criteria that MI sets forth – it can be impeded by brain damage, has its savants and extraordinary individuals, has a clear core set of operations and a distinctive developmental history, it is clearly evolutionarily functional and well supported by experimental psychology and psychometrics and is encodable symbolically. The only way in which Gardner can conclude that there is no ‘face-recognition intelligence’ is that he does not regard it as “capturing a reasonably complete gamut of the kinds of abilities valued by human culture.” But why should the recognition of faces be a subset of interpersonal intelligence (as I am sure Gardner would assert) but musical ability is not a subset of some other intelligence? I am confident, for example, that someone

³⁸ <reference?>

from the mediaeval Europe would happily have classed music as mathematical, since music was considered a branch of mathematics at that time. Clearly this is because Gardner is not a mediaeval scholastic, but a modern Harvard professor for whom music is something valued strongly and clearly distinct from arithmetic or geometry.

Consider again Gardner's description of the way in which he arrived at his set of intelligences, writing in *Frames of Mind* that "... it must be admitted that the selection (or rejection) of a candidate intelligence is reminiscent more of an artistic judgement than of a scientific assessment. Borrowing a concept from statistics, one might think of the procedure as a kind of subjective factor analysis."

This is worth examining a bit more closely. In statistics factor analysis works by taking a set of variables and an outcome and mathematically creating a model for the data which will say how the outcome can be described either in terms of pre-existing variables or in terms of unknown variables. The process works by first identifying a factor which best describes the largest part of the outcome, then removing that factor and looking at the remaining variation, repeating the process to find another important factor and so on.

From this description it is clear that what Gardner has done is to look for things that he values which are not 'accounted for' by previously identified factors, then remove those abilities which form what he sees as a 'factor' or kind of intelligence, then to re-examine the remaining set of abilities and so on. But the judgements involved in selecting one or another set of cognitive abilities as "an intelligence" arise from the personal and cultural assumptions of the individual. Were a different person than Gardner, coming from a different personal and cultural background, to attempt a similar analysis I believe it is likely they would end up with a very different list of 'intelligences' all meeting the same criteria but dividing the modular aspects of mental processing into quite different sets. Such a person

might then consider and reject various of Gardner's intelligences as merely combinations of these others.³⁹

Nowhere does this seem clearer to me than in Gardner's discussion of candidates for new intelligences in his revision of the theory *Intelligence Reframed*⁴⁰ Here he considers several proposed additional capacities, accepting one (naturalist intelligence) and rejecting (or mostly rejecting) two others (Spiritual intelligence and Moral intelligences). His discussion of naturalist intelligence is quite brief, and to my mind somewhat misleading. For example he applies his criterion of isolation by brain damage by claiming "examples, widely reported in clinical and experimental studies... of brain-damaged people who remain able to recognize and name inanimate objects but lose the ability to name living things"⁴¹ or vice versa. Gardner does not cite these studies, but I assume he refers to the patterns observed in Alzheimer's patients, where the ability to name "natural kinds" may be less or more impeded than the ability to recognise "artifacts." However there is considerable evidence that this is due, not to the existence of specific brain functions for 'natural' and 'artificial' but to the way in which the semantic aspects of these 'categories' are used.⁴² If this is so then it would make no more sense to claim a 'natural' vs. 'artificial' mental capacity than to claim the existence of 'English'

³⁹ I do not mean, here, such alternate 'multiple intelligence' theories as Robert Sternberg's "Triarchic" theory of intelligence, which use an entirely different set of axes (and, arguably, a more defensible one). There are many competing "multiple intelligence" theories of this sort. I mean here that one could use exactly the same framework as Gardner, but fill it out quite differently if starting from different cultural assumptions. One might then argue, perhaps as Plato might have, that Gardner's 'linguistic' intelligence conflates "rhetorical" and "poetic" intelligences, just as his 'musical intelligence' is some combination of 'mathematical' and 'poetic' and his "interpersonal" MI is better described using "rhetorical" and "martial" intelligences...

⁴⁰ Gardner, *Frames of Mind* (1993), 47-67.

⁴¹ *Ibid*, 51.

⁴² E. Anderson, A. Almor, J. Aronoff, L. Gonnerman, and D. Kempler, "Implications of Distributed Representations for Semantic Processing: Evidence from Alzheimer's Disease", *Proceedings of the Proceedings of the Twenty-Fifth Annual Conference of the Cognitive Science Society* 1 R. Alterman, and D. Hirsh, eds. (Florence, KY: Psychology Press, 2004), 97-102.

intelligence distinct from 'Spanish' intelligence because a patient may lose the ability to name things in one language but not the other.⁴³

The separation of the world into "natural" and "man-made" is, in fact, a very culturally specific one and a distinction that is both quite recent and arguably quite destructive in modern culture⁴⁴. Including this distinction as part of his theory embeds this conceptual structure within the theory, and asserts it is a distinction that exists within the structure of thought itself.

On the other hand, Gardner chooses to *not* include a "spiritual or religious" intelligence. His discussion of this is much longer than his pronouncement of Naturalist intelligence and while the 'natural' is accepted directly and unapologetically, the 'spiritual' is approached with much circumlocution. "The realm of the naturalist seems straightforward. In contrast, even a hesitant entry into the world of the spiritual reveals a far more complex picture".⁴⁵ Simply put, Gardner isn't willing to say there is such a thing. This is fair, but clearly a completely cultural judgement. It is hard to imagine many cultures other than our own in which the spiritual would not be a presumption of any ontology. There can be few concepts more central to the history and culture of humans from the beginning, and indeed the existence of burial ceremony among early humans is often pointed to as proof that individuals of these cultures had reached a level of abstraction similar to that of modern people.

Every argument made for naturalist intelligence could be made for the spiritual/religious, including a much stronger case for isolation by brain damage for example. But Gardner picks apart the spiritual into pieces (concern with cosmic questions, achieving a state of being, having an effect on others) which many would say miss the mark already, and then dismisses these as either contained by other

⁴³ Things like this really do happen. I chose this example from Mendez, M. "Language-Selective Anomia in a Bilingual Patient", *The Journal of Neuropsychiatry and Clinical Neurosciences* 2000; vol 12 pp 515-516

⁴⁴ Reference needed.

⁴⁵ Gardner, *Frames of Mind* (1993), 52.

intelligences (including the curious statement that “one might construe the ‘gymnastic’ aspect of controlling mental states [meditation] as a subspecies of bodily-kinesthetic intelligence”) or not related to intelligence at all. Finally he concludes that religion and spirituality fail to be intelligences since “whatever intellectual powers may be reflected in the achievements of a Buddha or a Christ, it seems clear that “problem solving” or “product making” is not an appropriate description.”⁴⁶

The idea that religion is neither problem solving nor product making would astound any person engaged with the world in these terms, from Shaman to Rabbi to Priest, and from mystic to missionary to theologian. I am struck by the comment, quoted by Gardner himself, that his students “have concluded that I can recognise only the intelligences I myself possess.”⁴⁷ I am forced to agree!

Implicit in Gardner’s theory is a particular view of the world and what is to be valued. When the theory becomes the basis for practice within education that world-view is made a part of the structure of education and in how thinking itself is conceived.

Thus, when MI is promoted as a desirable basis for educational practice (ironically often because it is perceived as recognising and supporting individual and cultural diversity) there is a, probably unrecognised, imposition of a particular cultural framework. When it is urged as, to quote one paper, “The Most Effective Platform for Global 21st Century Educational and Instructional Methodologies”⁴⁸ there is an unintended and disturbing conceptual and cultural imperialism at work.

By declaring its ‘intelligences’ to be scientifically based, rather than reflecting personal and cultural preferences, MI theory places those preferences outside the realm of criticism or even conscious examination and subverts the cultural views of those adopting it.

⁴⁶ Ibid.,.58.

⁴⁷ Ibid., 47.

⁴⁸ D. McFarlane, “Multiple Intelligences: The Most Effective Platform for Global 21st Century Educational and Instructional Methodologies” *College Quarterly* 14.2 (Spring 2011).

But there is an additional concern I feel with MI theory which is even more fundamental.

The 'Theological' Values (and Issues) of MI

One of the criticisms often raised with Gardner is his use of the term “intelligences” in the first place... where most people would refer to ‘intelligences’ such as music or bodily-kinesthetic as abilities or (to choose another word with its own cultural implications) as abilities or talents.

In part Gardner acknowledges that the term is deliberately provocative. “I am quite confident that if I had written a book called *Seven Talents* it would not have received the attention that *Frames of Mind* received.”⁴⁹ But there is another reason behind this, clear in Gardner’s strong reaction to those who claim that he is misusing the term: “In delineating a narrow definition of intelligence [...] one usually devalues those capacities that are not within that definition’s purview: thus dancers or chess players may be talented but they are not smart. [...] I balk at the unwarranted assumption that certain human abilities can be arbitrarily singled out as qualifying as intelligence while others cannot.”⁵⁰

Such statements (and many like them) make sense only if we see the word “intelligence” as somehow specially privileged. After all, selecting certain abilities as included and others as excluded is what defining a term is *about*. The objection makes sense only if things which are ‘intelligence’ have value, and those which are not intelligence do not.

There is certainly a bias of that sort in our society, a certain subliminal Gnosticism that pervades a lot of our value systems, and perhaps especially those of a Harvard professor. In declaring all things that are to be valued to be ‘intelligence’, Gardner entrenches the bias which sees the intellect as superior to other attributes. While attempting to extend value to other areas he in fact only makes higher the fence that excludes non-cerebral abilities from being worthy.

⁴⁹ Gardner, *Frames of Mind* (2011), #.

⁵⁰ Gardner, *Frames of Mind* (1993), xxxiv.

Do we really want to say that in order to value something we must declare it to be an intelligence, and that the only way to care about and value people is to say that they are “smart”? Gardner is aware that the concept of a single, general, intelligence has created much harm, and it is admirable that he wishes to avoid some of the abuses of the concept. But replacing a dictatorship with an oligarchy is no improvement for the powerless, and indeed I believe that MI theory only perpetuates and affirms the idea that human value is derived from ability. I believe that, in ‘promoting’ a selection of abilities to the status of ‘intelligences’ in order that they may be valued, Gardner is affirming an elitism that is all the stronger for having been broadened in scope.

What is more, by changing the status of what is valued from ‘abilities’ (which I think most people view as something which can be acquired and learned) to ‘intelligence’ (which is something inherent in a person, which can be developed but not acquired) Gardner may be changing how we think about what education does. One hazard of ‘IQ’ in education is that it sets expectations which students then live up to (or, more problematically) down to.⁵¹ Putting all abilities in the same class seems likely to only compound these issues. A student who believes their difficulties in soccer or piano are because they lack ‘kinesthetic’ or ‘musical’ intelligence may never put in the hours of effort needed (and perhaps sufficient⁵²) to achieve mastery in those areas.

If we accept that we should value others through these multiple intelligences, then by promoting some cognitive abilities to the status of ‘intelligences’ (and hence to be valued) and not others, Gardner not only places his values as the definition of intelligence. In doing so he essentially places himself as gate-

⁵¹ L. Jacobson and R Rosenthal *Pygmalion in the classroom: teacher expectation and pupils’ intellectual development*. (New York: Holt, Rinehart & Winston, 1968).

⁵² Malcolm Gladwell, for example, makes the argument that beyond a certain threshold the amount of time spent is the major determiner of mastery in fields as diverse as hockey and software engineering (with approximately 10,000 hours of meaningful effort being required for such mastery) see Malcolm Gladwell on the “10,000 Hour Rule” in *Outliers* (New York: Black Bay Books, 2008), 35-55.

keeper over what we will promote and value, both within the classroom and in the ways we teach students to value themselves.

I beg the reader's indulgence for referring to such questions, regarding what we should ultimately value and what gives us value as creatures, as 'theological' questions – but unlike Gardner I do see this as a class of human understanding, whatever one's position on the nature or existence of a deity. In implicitly asserting that all value comes from worthiness, and in particular from being 'smart', Gardner is making a claim that falls within this domain.

To show that this is not the only way to value people consider, in contrast, Jean Vanier, who created communities with (not for!) mentally disabled people. Groups such as L'Arche community provide a place where people, with and without disability, can live, celebrate, and belong together. He speaks and writes a great deal about love, freedom, belonging and value. He believes strongly in valuing all people.

But Vanier does not do this by deciding that people with intellectual disabilities have some overlooked form of intelligence which we should value them *for*. We should and must value them because they are human and because they are loved. And he asserts that in valuing others we discover our own value, not in seeking an ideal or set of ideals based on merit.

"The image of the ideal human as powerful and capable disenfranchises the old, the sick, the less-abled," Vanier writes. "So long as we define our worth in terms such as these we are going to see those who are not powerful or capable as less than fully human, and even threatening."⁵³

⁵³ J. Vanier, *Becoming Human* (Toronto: House Anansi Press, 1998), #.

When people talk about using MI theory to find ways to value our students, or when we insist that every student is “special”, we try to create self-esteem in them by telling them they are worthy for a reason... and if those reasons sound hollow (as often they must) then their value is hollow too.

I believe that we seize on systems like multiple intelligences and use them to tell our students that they are worthy, because otherwise these students might not be affirmed by our school system. And this is all the more important because we have so few other systems now to tell students they are valued.

But implicit in adopting this approach is the message that worth is created by ability, and not just any ability but those which we can define as ‘intelligence’.

We have seen that the claims of MI theory to scientific status are not supported, and that it represents a particular way of organizing and valuing the world. This approach has been adopted not because it is truer than others or more useful, but because it supports a particular set of beliefs, and what is more in doing so it brings with it assumptions of what is important and of value. I am suggesting that the way of valuing implicit in this ‘theory’ is not necessary and perhaps destructive.

Perhaps it is better to recognise that the school is not, after all, the best or only mechanism for valuing our children. Rather than try to make everyone ‘smart’ in some fashion we must recognise that being smart is no more (or less) important than being tall or friendly or dexterous.

As Vanier argues, I believe we can, and must, find better ways to value people, not because they are smart, or talented, or special... not ‘because’ of anything. We need to learn how to value people as human. Just like everybody else.