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ABSTRACT

Stephen Jay Gould points out in "The Mismeasure of Man" (1981), "Science, since people must do it, is a socially embedded activity. It progresses by hunch, vision, and intuition." The legacy of the traditional construct of intelligence and its measurement through intelligence quotient (IQ) tests has not been educational improvement. Its legacy in the classroom has most often been the denial of educational opportunity in the guise of cognitive ability grouping. IQ testing has promoted racism through the placement of students. The modern construct of intelligence has been narrow, ignoring the many types of intelligences that exist in people. Human ability has been modeled in a manner that has caused harm to many and at great cost in terms of resources, wasted opportunity, and divisiveness. Intelligence tests are actually constructed to produce a bell-shaped curve in which 50% of test takers are required to score below average. The reasonableness of this process is seldom questioned despite the lack of evidence that intelligence is actually distributed in this way among humans. The truth being sought has not been found, and as Frankenstein came to realize, a very long experiment has gone wrong. It is time to give up faith in the numbers generated by testing and to acknowledge intelligence as something other than a straight line, as a construct more resembling a tangled bush than a ladder. (Contains 13 references.) (SLD)

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Session
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SCIENCE, INTELLIGENCE, AND EDUCATIONAL POLICY: THE MISMEASURE OF FRANKENSTEIN*

(*with apologies to Mary Shelley and Stephen Jay Gould)

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Yogi Berra is alleged to have said, "It feels like deja vu all over again." I'm with him. The intelligence discussion is upon us again, having cycled around more times than I can count in the last hundred years alone.

And we are here again, today, in 1995, discussing the construct of intelligence and whether it is relevant to the classroom. An interesting exercise, I suppose, although I must confess, my gut reaction is "been there, done that."

Nonetheless, we're here - so let's go round one more time. Let's take a closer look at the I-word - at this construct which we've named intelligence.

Come to think of it, that may have been our first mistake. One of the problems with constructs is they refuse to remain abstract and theoretical. We reify them, imbuing them with a life of their own, once we give them a name (sort of like Dr. Frankenstein pulling the switch - It's alive!)

John Stuart Mill (in Gould, 1981) recognized that:

> The tendency has always been strong to believe that whatever received a name must be an entity or being, having an independent existence of its own. And if no real entity answering to the name could be found, men did not for that reason suppose that none existed, but imagined that it was something peculiarly abstruse and mysterious.

Intelligence as a modern co struct, however, has more than just its name going for it. For the past hundred years, in a claim as grandiose as any ever made by philosophy or science, we have believed that not only do we know what intelligence is all about, we can accurately measure it and rank people according to how much they have.

How did this happen? What has it done? What does it mean for our schools? And our children?

Alfred Binet, like Dr. Frankenstein, started out with good intentions. He was asked to create a test which could identify schoolchildren who might require extra assistance to be successful in school. In a remarkable illustration of "timing being everything," a new science was developing at the same time - the science of psychology. This new field had as its purpose using scientific methods to measure the elements of the mind. Laboratories had been established and people's perceptions were being analyzed in exquisite detail in an attempt to provide a window into mental life. Binet's test opened that window with a vengeance. And, as many have concluded, psychology had found its *raison d'etre*.

Within ten years, psychology had "scientifically" developed a means by which the mystery of intelligence was to be solved. A set of simple tasks, when performed by a child or adult in a short period of time, yielded a snapshot - a number which came quickly to be known as an Intelligence Quotient - there we go naming things again - and this time we had the quantification of science behind us to boot. (Keep in mind that the quantification of science had already given us other measurable things like Phlogiston - particles with negative weight; a diagnostic criteria for identifying witches; and even measuring intellectual ability by the size of the skull or phrenology's bumps on the head.) Nevertheless, we plunged onward. We had found the tangible representation of intelligence and we had measured it. We had created the monster.

People are, however, not always so quick to believe in monsters and a few eyebrows were, in fact, raised. But we were ready. When the monster's existence was questioned, we created statistical processes to prove that it was really there. Charles Spearman developed factor analysis to show that a general intellectual ability which he called "g" could be extracted from IQ scores. Not surprisingly, his new procedure, which was designed to find "g," confirmed the existence of "g." Interestingly enough, however, if you carry his procedure further and rotate the factors through the matrix of scores (a legitimate and oft-used procedure), "g" disappears. Instead there appear to be a number of more specific abilities which are being measured by the tests. Despite the feuding that this finding set off in the testing community, the existence of innate, measurable intelligence was not questioned. And factor analysis, in an incredibly circular fashion, was said to be the proof, for either side of the argument. The scientists (even with their 'minor" disagreements) with their numbers and facts and objectivity said it. It must be so.

Unfortunately two realities which give lie to this belief went unnoticed at the time First, as

the preceding episode underscores, scientific objectivity is, in reality, a myth. My friend, Bernice Lott (1994), at the University of RI, describes "objectivity" as merely a group's "inter-subjectivity." The best science cannot escape the context of its practitioners. The worst science is so imbedded in subjectivity that its conclusions are little more than doctrines upon which to base a dogmatic campaign of persuasion to a particular point of view. As a scientist, I must know that the minute I forget this reality, I cease doing scientific work.

Stephen Jay Gould points out in *The Mismeasure of Man* (1981), "Science, since people must do it, is a socially embedded activity. It progresses by hunch, vision, and intuition. Much of its change through time does not record a closer approach to absolute truth but the alteration of cultural contexts that influence it so strongly. Facts are not pure and unsullied bits of information; culture influences what we see and how we see it."

The second reality, which builds on this first, is that the men who were promoting this scientific breakthrough, men with names famous in psychology - Terman, Goddard, Yerkes, Brigham and others - were politicians as much, if not more so, than scientists. And politicians with an agenda. All were closely and publicly tied to the eugenics movement in this country. Fueled by racism and classism, they believed that certain groups of people were inherently superior to others and that for this country to remain strong, breeding by "undesirables" already living here must be discouraged. Immigration of additional undesirables was also to be discouraged. Those judged inferior were considered the victims of their own genetic defects.

It was these men who told us they had found intelligence, who defined it and then showed us how it could be measured. It should come as little surprise that scientific studies of intelligence by these "scientists" completely confirmed their beliefs. Northern Europeans (and their descendants in this country) were found to have the highest levels of intelligence. Southern and Eastern Europeans were much less capable. African-Americans were lower still. In retrospect, the methodology used in these studies is laughable. That we allowed ourselves to believe that a simple test could tell us so much from what was literally a "snapshot" of a narrow bit of behavior is also laughable. But the "science" of it all had entered our consciousness and the monster was let loose to terrorize the countryside. As Leon Kamin (1974) points out, "the consequence has been that the IQ test has served as an instrument of oppression against the poor - dressed in the trappings of science, rather than politics."

For while we have acknowledged the problems with the early research, we still believe in the instruments. The discussion of their usefulness has gone back and forth since the beginning - from the debates between Terman and Walter Lippman to Leon Kamin's debunking of Cyril Burt, to the current discussion of *The Bell Curve*. Still, IQ tests and their relatives determine the educational landscape from preschool through the university years. Even the most skeptical among us have trouble believing that those numbers don't

mean something.

And, likewise, even the best intentions of today's test designers and educators cannot overcome the context in which the construct of intelligence was created. Today's intelligence tests are created in the same manner as Terman's and Yerkes' and Brigham's. They are constructed to produce a bell-shaped curve which requires 50% of the test takers to score below average. Think about that - half of the people in the world must be labeled subnormal by the test. The reasonableness of this process is seldom questioned despite no evidence - except for the test's results - that intelligence is distributed this way in humans. Circularity strikes again. And it continues.

As we have seen, the eugenicists tests produced disparate results for different groups of people. Their descendants have difficulty breaking from this mold. Why? In addition to building a bell shaped distribution of scores, item selection reinforces the status quo. "Good items" are those which high scorers on the test tend to get right. "Bad items" are those which low scorers tend to answer correctly. The circularity is more than enough to make you dizzy. Nonetheless, this procedure continues to be used and makes it nearly impossible to change biases which exist in the tests.

Finally, when new IQ tests are designed, we determine if they are valid by seeing how well they correlate with existing IQ tests. If they measure the same thing, they must be measuring intelligence! We have come full circle.

(In an aside.....It is interesting to note that as long as the test results agree with prevailing views, these procedures remain in place. Dr. Jerry Hirsch (1994), of the University of Illinois, reminded participants at a conference this fall that in the early IQ days, when girls were outscoring boys on the test, normal design procedures were suspended and items changed until both genders were receiving similar scores. The designers *knew* that girls could not be smarter than boys - so the test must be in error. Such a correction was not considered necessary in any of the other cases of disparate results.)

And stil' we have faith in the numbers. We have faith in the numbers despite the fact that testing, like science, is culture bound.

We have had faith in the numbers for decades as IQ scores have told us what we can expect from our children. As they have sorted our children into tracks. As they have told us who will benefit from education and on whom it should not be wasted. As they have told us that some children could only do drills and rote memorization while others challenged their imaginations. As they have allowed some children access to opportunities. As they have denied these same opportunities to others.

In the first decades of this century, the eugenicists told us that intelligence tests were not biased, that everyone had the same chance to do well, limited only by his (and only

sometimes, her) innate ability. Despite nearly a century of evidence to the contrary, that same claim is made today. Yet these same tests continue to place disproportionate numbers of African-American and Latino children into special education classes while filling gifted and talented programs with White, middle and upper-class children. These same tests have labeled untold numbers of children as "retarded" because they were deaf, because they posed behavior problems, because they learned and expressed themselves in a different way from that envisioned by the test, because they spoke a language other than English, or because the questions on the test were irrelevant or meant something completely different in their culture.

California, as a result of the *Larry P.* case, no longer allows Black children to be given IQ tests. Entered into testimony in that case was a statement by David Wechsler, creator of one of the most widely used IQ test series. He acknowledged that his tests could not properly be used for African-American children, for they had never been normed or validated for Black children (Affeldt & Paterson, 1994). The same holds true for most of these instruments. And yet we still have faith in the numbers - we still believe we can learn all we need to know about any child from these snapshots.

And the snapshots have proliferated. Rivaling IQ scores for their impact on society are their direct descendants - SAT scores. Carl Brigham, an IQ pioneer whose eugenic views were documented in his book, *A Study of American Intelligence*, designed the SAT test basing it on the famous Army Alpha series. Much as IQ tests sort children in the earlier grades, the SAT series plays gatekeeper at the university door. While its use in the admissions process is well known, the SAT series has a much broader reach.

It also determines who will win prestigious awards like National Merit Scholarships. Semifinalists for this competition are chosen solely on the basis of Preliminary SAT scores. Despite the fact that more girls take the exam and that they perform better in both high school and college, each year a majority of the semifinalists (and eventual scholarship winners) are boys. Most of the girls are eliminated from the competition in the first round by a score on a test which the testmakers' own research says is gender- biased. Similarly, SAT scores determine who is eligible to play collegiate athletics and to receive athletic scholarships. Since institution of a test score cutoff, forty-five percent of otherwise qualified Black student-athletes who would have graduated have been denied eligibility, as compared to 6% of Whites (McIntosh Commission, 1994). And still we have faith in the numbers.

I have attempted to find evidence to justify the faith. We have been using these tests in our classrooms for nearly a century. I tried to find evidence of the massive good that IQ testing has done to justify the time and the resources it has taken, not to mention the damage it has done. I was startled by the silence. Despite all of the promises made by proponents over the years, I was not successful in finding such evidence. At least I'm not alone. Dr. Asa Hilliard (1991), who spoke to this conference last year, has also been searching. He could find no data to support the educational use of IQ scores. "I have yet to see," he states, " a

demonstration anywhere to show that the use of IQ tests makes a positive difference in the achievement of children. ... Intelligence as a construct and currently used IQ tests fail education, not merely because of their readily apparent technical poverty, or because of demonstrable cultural bias, but because they are, at present, useless as instructional tools."

There are some who claim that some parts of some tests are helpful in diagnosing some specific learning problems. An IQ score, and the permanent label that comes with it, is clearly not critical for this purpose and specific performance tasks which identify the problem might well serve better. As for the claim that a disadvantaged child with a high IQ will see doors open because of that score....this seems to be a much talked about but rare occurrence - and hardly balances the great harm done to generations of children.

The fact remains that the legacy of our by now traditional construct of intelligence and of IQ tests has not been educational improvement. Its legacy in the classroom has most often been denial of opportunity in the guise of cognitive ability grouping. It has promoted racism under cover of placing children where they are best suited. And still we have faith in the numbers.

So far, our faith in the numbers has allowed the monster we created to run amok - and if we allow it to do so it will continue to wreak havoc on the generations to come. Stephen Jay Gould (1981) reminds us that "we pass through this world but once. Few tragedies can be more extensive than the stunting of life, few injustices deeper than the denial of an opportunity to strive or even to hope, by a limit imposed from without, but falsely identified as lying within."

The testing movement has taken a somewhat different view. David Owen (1985) points out that Henry Chauncey, Carl Brigham's successor, felt that tests could serve society by "dampening the aspirations of the undeserving." Chauncey said " To many, the prospect of measuring in quantitative terms what have previously been considered intangible qualities is frightening, if not downright objectionable. Yet I venture to predict that we will become accustomed to it and will find ourselves better off for it....Life may have less mystery, but it will also have less disillusionment and disappointment. Hope will not be a lost source of strength, but will be kept within reasonable bounds." Chauncey's comments are eerily similar to Herrnstein and Murray's (1994) admonition in *The Bell Curve* that different groups of people should learn to appreciate what they do well and not aspire to other things outside their natural capabilities. Deja vu all over again.

So, how do we break the cycle? How do we rein in the monster we have created?

Some suggest we separate the construct of intelligence from the ways in which we have measured it. For example, Gardner's Multiple Intelligences and Sternberg's Triarchic Theory of Intelligence have indeed given us alternative ways to look at how we come to know things, and can suggest ways to open the learning process to accommodate a broader range

of experience and abilities. The possibilities they offer are intriguing and refreshing. But separating the construct of intelligence from IQ scores is like trying to separate the science of intelligence from the politics. The pull of the numbers is strong. And so are the prejudices that people hold. We must take care to remember that theory has a way of transforming itself in practice. New constructs, once named, may no longer be under our control. The monster is strong and it will be a difficult battle.

I admit to being skittish. I would caution those who explore the world of intelligence by paraphrasing the Hippocratic Oath and Noam Chomsky (1976) writing in *The IQ Controversy*. First, they both say, do no harm. Take care that new formulations which promise to open educational opportunities do not instead degenerate into obstacles as did their predecessors.

And for those who would look to build a bridge, to utilize the construct of intelligence in the classroom, I would offer a comment by C. Dalton Jones (1975) in his article "What do IQ tests measure?." "Whatever intelligence is," he says, "almost everybody has it, but the manifestations or expression of it varies from person to person." We need know little more about intelligence than this to design a good educational system. As Hilliard (1991) points out, "...in my experience with teaching that succeeds, I do not know of a single instance in which the educators or psychologists relied upon IQ tests!" The bell curve mentality must be replaced and the deification of numbers must end.

In order to give up our faith in the numbers, however, we must also give up our need to see everything in our experience as progressing in a straight line from better to worse, positive to negative, advanced to primitive, superior to inferior. Stephen Jay Gould (1981) calls this the "fallacy of ranking." Humans are not the pinnacle of an evolutionary march up the ladder of excellence. We are merely a random branch on the evolutionary bush, unique in our own right, along with many other branches.

A bush provides perhaps a better model for bringing the construct of intelligence into the classroom as well. Human abilities cannot be rank ordered on a straight line. As we grow we do not find our place on an ability ladder, higher than some and lower than others. We are more likely to find ourselves, instead, on branches of a tangled and complicated ability bush.

Rather than looking for a student's place on the ladder, then, teachers would do better to find his or her strong branches and work with those to build up any which might be weaker. This model leads to a more individualized classroom, and a valuing of diversity in learning styles and experience, not conformity to one view of how things should be done. When we focus only on the ladder of traditional schooling, we miss out on the breadth of human possibilities.

While some of the newer formulations of intelligence are leading us back in this direction,

this is not an altogether new idea. I read the following poem to students in my university classes to start them thinking about what is important in their performance. It is more than 700 years old. In the thirteenth century, the poet Rumi (in Barks & Moyne, 1988) wrote of the

"Two Kinds of Intelligence"

There are two kinds of intelligence: One acquired,
as a child in school memorizes facts and concepts
from books and from what the teacher says,
collecting information from the traditional sciences
as well an from the new sciences.

With such intelligence you rise in the world.
You get ahead or behind others
in regard to your competence in retaining
information. You stroll with this intelligence
in and out of fields of knowledge, getting always more
marks on your preserving tablets.

There is another kind of tablet, one
already completed and preserved inside you.
A spring overflowing its springbox. A freshness
in the center of the chest. This other intelligence
does not turn yellow or stagnate. It's fluid,
and it doesn't move from outside to inside
through the conduits of plumbing-learning.

This second knowing is a fountainhead
from within you, moving out.

The modern construct of intelligence has been a narrow, rigid and unrelenting monster. It has been a racist monster. It has been a monster which ignored all the other kinds of "intelligences" that exist in people. It terrorized the classroom. In modeling human ability it has led us up an imaginary ladder and left us with nowhere to go. It has caused devastation on an intolerable scale. The cost of maintaining the monster - in resources, wasted opportunity, divisiveness and human lives - is far too great.

It is time we, like Dr. Frankenstein, come to realize that we have not found the truth we were seeking, but are simply playing out a very long experiment gone wrong. It is time to give up our faith in the numbers. It is time to consign the monster to the dustbin. And move on.

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