

Beyond the IQ: Education and Human Development

Developing the Spectrum of Human Intelligences

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Allow me to transport all of us to the Paris of 1900 – La Belle Epoque. Around 1900 the city fathers of Paris approached a psychologist named Alfred Binet with an unusual request: Could he devise some kind of a measure which would predict which youngsters would succeed and which would fail in the primary grades of Paris schools? As everybody knows, Binet succeeded. He produced a set of test items which could predict a child's success or failure in school. In short order, his discovery came to be called the "intelligence test"; his measure, the "IQ." Like other Parisian fashions, the IQ soon made its way to the United States, where it enjoyed a modest success until World War I. Then, it was used to test over one million American recruits, and it had truly arrived. From that day on, the IQ test has looked like psychology's biggest success – a genuinely useful scientific tool.

What is the vision that led to the excitement about IQ? At least in the West, people had always relied on intuitive assessments of how smart other people were. Now intelligence seemed to be quantifiable. You could measure someone's actual or potential height, and now, it seemed, you could also measure someone's actual or potential intelligence. We had one dimension of mental ability along which we could array everyone.

The search for the perfect measure of intelligence has proceeded apace. Here, for example, are some quotations from an ad for a widely used test:

Need an individual test which quickly provides a stable and reliable estimate of intelligence in four or five minutes per form? Has three forms. Doesn't depend upon verbal production or subjective scoring. Can be used with the severely phys-

This article is based on an informal talk given at the 350th anniversary of Harvard University on September 5, 1986. It has been edited only in the interests of greater clarity. No formal references have been included. The reader interested in documentation of the theory of multiple intelligences is referred to my book *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983). More recent articles, which treat educational implications of the theory, are: Joseph Walters and Howard Gardner, "The Development and Education of Multiple Intelligences," in *Essays on the Intellect*, ed. Frances Link (Washington, DC: Curriculum Development Associates, 1985); and Joseph Walters and Howard Gardner, "Multiple Intelligences: Some Issues and Answers," in *Practical Intelligences*, ed. Robert Sternberg and Richard Wagner (New York: Cambridge University Press, 1987). The work reported in this article was supported by the Rockefeller Foundation, the Spencer Foundation, and the Bernard Van Leer Foundation.

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ically handicapped (even paralyzed) if they can signal yes or no. Handles two-year-olds and superior adults with the same short series of items and the same format. Only \$16.00 complete.

Now, that's quite a claim. Arthur Jensen suggests that we could look at reaction time to assess intelligence: a set of lights go on; how quickly can the subject react? Hans Eysenck suggests that investigators of intelligence should look directly at brain waves.

There are also, of course, more sophisticated versions of the IQ test. One of them is called the Scholastic Aptitude Test (SAT). It purports to be a similar kind of measure, and if you add up a person's verbal and math scores, as is often done, you can rate him or her along that dimension. Programs for the gifted, for example, often use that kind of measure.

I want to suggest that along with this one-dimensional view of how to assess people's minds comes a corresponding view of school, which I will call the "uniform view." In the uniform school, there is a core curriculum, a set of facts that everybody should know, and very few electives. The better students, perhaps those with higher IQs, are allowed to take courses that call upon critical reading, calculation, and thinking skills. In the "uniform school," there are regular assessments, using paper and pencil instruments, of the IQ or SAT variety. They yield reliable rankings of people; the best and the brightest get into the better colleges, and perhaps—but only perhaps—they will also get better rankings in life. There is no question but that this approach works well for certain people—Harvard is eloquent testimony to that. Since this measurement and selection system is clearly meritocratic in certain respects, it has something to recommend it.

But there is an alternative vision that I would like to present—one based on a radically different view of the mind, and one that yields a very different view of school. It is a pluralistic view of mind, recognizing many different and discrete facets of cognition, acknowledging that people have different cognitive strengths and contrasting cognitive styles. I would also like to introduce the concept of an individual-centered school that takes this multifaceted view of intelligence seriously. This model for a school is based in part on findings from sciences that did not even exist in Binet's time: cognitive science (the study of the mind), and neuroscience (the study of the brain). One such approach I have called my "theory of multiple intelligences." Proceeding rapidly, I will now tell you something about its sources, its claims, and its educational implications for a possible school of the future.

Dissatisfaction with the concept of IQ and with unitary views of intelligence is fairly widespread—one thinks, for instance, of the work of L. L. Thurstone, J. P. Guilford, and other critics. From my point of view, however, these criticisms do not suffice. The whole concept has to be challenged; in fact, it has to be replaced.

I believe that we should get away altogether from tests and correlations among tests, and look instead at more naturalistic sources of information about how people around the world develop skills important to their way of life. Think, for example, of sailors in the South Seas, who find their way around hundreds, or even thousands, of islands by looking at the constellations of stars in the sky, feeling the way a boat passes over the water, and noticing a few scattered landmarks. A word for intelligence in a society of these sailors would probably refer to that kind of navigational ability. Think of surgeons and engineers, hunters and fishermen, dancers and choreographers, athletes and athletic coaches, tribal chiefs and sorcer-

ers. All of these different roles need to be taken into account if we accept the way I define intelligence—that is, as the ability to solve problems, or to fashion products, that are valued in one or more cultural settings. For the moment I am saying nothing about whether there is one dimension, or more than one dimension, of intelligence; nothing about whether intelligence is inborn or developed. Instead I emphasize the ability to solve problems and to fashion products. In my work I seek the building blocks of the intelligences used by the aforementioned sailors and surgeons and sorcerers.

The science in this enterprise, to the extent that it exists, involves trying to discover the right description of the intelligences. What is an intelligence? To try to answer this question, I have, with my colleagues, surveyed a wide set of sources which, to my knowledge, have never been considered together before. One source is what we already know of the development of different kinds of skills in normal children. Another source, and a very important one, is information on the ways that these abilities break down under conditions of brain damage. When one suffers a stroke or some other kind of brain damage, various abilities can be destroyed, or spared, in isolation from other abilities. This research with brain-damaged patients yields a very powerful kind of evidence, because it seems to reflect the way the nervous system has evolved over the millennia to yield certain discrete kinds of intelligence.

My research group looks at other special populations as well: prodigies, idiot savants, autistic children, children with learning disabilities, all of whom exhibit very jagged cognitive profiles—profiles that are extremely difficult to explain in terms of a unitary view of intelligence. We examine cognition in diverse animal species and in dramatically different cultures. Finally, we consider two kinds of psychological evidence: correlations among psychological tests of the sort yielded by a factor analysis of a test battery; and the results of efforts of skill training. When you train a person in skill A, for example, does that training transfer to skill B? So, for example, does training in mathematics enhance one's musical abilities, or vice versa?

Obviously, through looking at all these sources—information on development, on breakdowns, on special populations, and the like—we end up with a cornucopia of information. Optimally, we would perform a factor analysis, feeding all the data into a computer and noting the kinds of factors or intelligences that are extracted. Alas, this kind of material didn't exist in a form that is susceptible to computation, and so we had to perform a more subjective factor analysis. In truth, we simply studied the results as best we could, and tried to organize them in a way that made sense to us, and hopefully, to critical readers as well. My resulting list of seven intelligences is a preliminary attempt to organize this mass of information.

I want now to mention briefly the seven intelligences we have located, and to cite one or two examples of each intelligence. Linguistic intelligence is the kind of ability exhibited in its fullest form, perhaps, by poets. Logical-mathematical intelligence, as the name implies, is logical and mathematical ability, as well as scientific ability. Jean Piaget, the great developmental psychologist, thought he was studying *all* intelligence, but I believe he was studying the development of logical-mathematical intelligence. Although I name the linguistic and logical-mathematical intelligences first, it is not because I think they are the most important—in fact, I think all seven of the intelligences have equal claim to priority. In our society, however, we have put linguistic and logical-mathematical intelligences, figura-

tively speaking, on a pedestal. Much of our testing is based on this high valuation of verbal and mathematical skills. If you do well in language and logic, you will do well in IQ tests and SATs, and you may well get into a prestigious college, but whether you do well once you leave is probably going to depend as much on the extent to which you possess and use the other intelligences, and it is to those that I want to give equal attention.

Spatial intelligence is the ability to form a mental model of a spatial world and to be able to maneuver and operate using that model. Sailors, engineers, surgeons, sculptors, and painters, to name just a few examples, all have highly developed spatial intelligence. Musical intelligence is the fourth category of ability we have identified: Leonard Bernstein, Harvard Class of '39, has lots of it; Mozart, presumably, had even more. Bodily-kinesthetic intelligence is the ability to solve problems or to fashion products using one's whole body, or parts of the body. Dancers, athletes, surgeons, and craftspeople all exhibit highly developed bodily-kinesthetic intelligence.

Finally, I propose two forms of personal intelligence – not well understood, elusive to study, but immensely important. Interpersonal intelligence is the ability to understand other people: what motivates them, how they work, how to work cooperatively with them. Successful salespeople, politicians, teachers, clinicians, and religious leaders are all likely to be individuals with high degrees of interpersonal intelligence. Intrapersonal intelligence, a seventh kind of intelligence, is a correlative ability, turned inward. It is a capacity to form an accurate, veridical model of oneself and to be able to use that model to operate effectively in life.

These, then, are the seven intelligences that we have described in our research. This is a preliminary list, as I have said; obviously, each form of intelligence can be subdivided, or the list can be rearranged. The real point here is to make the case for the plurality of intellect. Also, we believe that individuals may differ in the particular intelligence profiles with which they are born, and that certainly they differ in the profiles they end up with. I think of the intelligences as raw, biological potentials, which can be seen in pure form only in individuals who are, in the technical sense, freaks. In almost everybody else the intelligences work together to solve problems, to yield various kinds of cultural endstates – vocations, avocations, and the like.

This is my theory of multiple intelligence in capsule form. In my view, the purpose of school should be to develop intelligences and to help people reach vocational and avocational goals that are appropriate to their particular spectrum of intelligences. People who are helped to do so, I believe, feel more engaged and competent, and therefore more inclined to serve the society in a constructive way.

These thoughts, and the critique of a universalistic view of mind with which I began, lead to the notion of an individual-centered school, one geared to optimal understanding and development of each student's cognitive profile. This vision stands in direct contrast to that of the uniform school that I described earlier.

The design of my ideal school of the future is based upon two assumptions. The first is that not all people have the same interests and abilities; not all of us learn in the same way. (And we now have the tools to begin to address these individual differences in school.) The second assumption is one that hurts: it is the assumption that nowadays no one person can learn everything there is to learn. We would all like, as Renaissance men and women, to know everything, or at least to believe in the potential of knowing everything, but that ideal clearly is not possible anymore. Choice is therefore inevitable, and one of the things that I want to argue

is that the choices that we make for ourselves, and for the people who are under our charge, might as well be informed choices. An individual-centered school would be rich in assessment of individual abilities and proclivities. It would seek to match individuals not only to curricular areas, but also to particular ways of teaching those subjects. And after the first few grades, the school would also seek to match individuals with the various kinds of life and work options that are available in their culture.

I want to propose a new set of roles for educators that might make this vision a reality. First of all, we might have what I will call "assessment specialists." The job of these people would be to try to understand as sensitively as possible the abilities and interests of the students in a school. It would be very important, however, that the assessment specialists use "intelligence-fair" instruments. We want to be able to look specifically and directly at spatial abilities, at personal abilities, and the like, and not through the usual lenses of the linguistic and logical-mathematical intelligences. Up until now nearly all assessment has depended indirectly on measurement of those abilities; if students are not strong in those areas, their abilities in other areas may be obscured. Once we begin to try to assess other kinds of intelligences directly, I am confident that particular students will reveal strengths in quite different areas, and the notion of general brightness will disappear or become greatly attenuated.

In fact, I am now involved with colleagues in two collaborations through which we are attempting to determine what assessment might be like in the future. One such effort, undertaken with my colleague David Feidman, is taking place at a local preschool, with which we are working closely. We have richly equipped the school with materials that should engage the range of the students' intelligences, and in fact we call our effort "Project Spectrum." The children are allowed to gravitate naturally to a wide variety of games, puzzles, and other materials, and they can show us, through their play activities, what their particular combinations of interests and strengths are. At the conclusion of the school year, we present what we call a "spectrum profile" for each child to his or her parents and teachers. This is a description in plain English of a child's particular cognitive profile, together with some concrete suggestions of what might be done at home, in school, and in the wider community, to help that particular child to develop his or her interests and abilities.

Our second research collaboration involves the teaching of the arts and humanities to preadolescent and adolescent students. We are working with ETS, which does many things other than administer the SAT. In this project, named ARTS PROPEL, we are trying to develop new ways of figuring out the strengths of students in the junior and senior high school in the arts and humanities. We are agreed that, whatever use paper-and-pencil tests may have in other areas, they are not the optimal way to reveal students' latent abilities in the arts and humanities. In ARTS PROPEL, students are working instead in a much more molar way on large-scale projects, which will then be collected in portfolios for us to assess. It is my hope that a student profile based on such assessments might serve at least as an adjunct to standardized testing, and that perhaps it may eventually even serve as an alternative to testing.

In addition to the assessment specialist, the school of the future might have the "student curriculum broker." It would be his or her job to help match students' profiles, goals, and interests to particular curricula and to particular styles of learning. Incidentally, I think that the new interactive technologies offer consider-

able promise in this area: it will probably be much easier in the future for “brokers” to match individual students to ways of learning that prove comfortable for them.

There should also be, I think, a “school-community broker,” who would match students to learning opportunities in the wider community. It would be this person’s job to find situations in the community, particularly options not available in the school, for children who exhibit unusual cognitive profiles. I have in mind apprenticeships, mentorships, internships in organizations, “big brothers,” “big sisters” — individuals and organizations with whom these students might work to secure a feeling for different kinds of vocational and avocational roles in the society. I am not worried about those youngsters who are good in everything. They’re going to do just fine. I’m concerned about those who don’t shine in the standardized tests, and who, therefore, tend to be written off as not having gifts of any kind. It seems to me that the school-community broker could spot these youngsters and find placements in the community that provide chances for them to shine.

There is ample room in this vision for teachers, as well, and also for master teachers. In my view, teachers would be freed to do what they are supposed to do, which is to teach their subject matter, in their preferred style of teaching. The job of master teacher would be very demanding. It would involve, first of all, supervising the novice teachers and guiding them, but the master teacher would also seek to ensure that the complex student-assessment-curriculum-community equation is balanced appropriately. If the equation is seriously unbalanced, master teachers would intervene and suggest ways to make things better.

Clearly, what I am describing is a tall order; it might even be called utopian. And there is a major risk to this program, of which I am well aware. That is the risk of premature billeting — of saying, “Well, Johnny is four, he seems to be musical, so we are going to send him to Juilliard and drop everything else.” There is, however, nothing inherent in the approach that I have described that demands this early overdetermination — quite the contrary. It seems to me that early identification of strengths can be very helpful in indicating what kinds of experiences children might profit from, but early identification of weaknesses can be equally important. If a weakness is identified early, there is a chance to attend to it before it is too late, and to come up with alternative ways of teaching or of covering an important skill area.

We now have the technological and the human resources to implement such an individual-centered school. Achieving it is a question of will, including the will to withstand the current enormous pressures toward uniformity and unidimensional assessments. There are strong pressures now, which you read about every day in the national and local newspapers, to compare students, to compare teachers, states, even entire countries, using one dimension or criterion, a kind of a crypto-IQ assessment. Clearly, everything I have described today stands in direct opposition to that particular view of the world. Indeed that is my intent — to provide a ringing indictment of such one-track thinking.

I believe that in our society we suffer from three biases, which I have nicknamed “Westist,” “Testist,” and “Bestist.” “Westist” involves putting certain Western cultural values, which date back to Socrates, on a pedestal. Logical thinking, for example, is important; rationality is important; but they are not the only virtues. “Testist” suggests a bias towards focusing upon those human abilities or approaches that are readily testable. If it can’t be tested, it sometimes seems, it is not worth paying attention to. My feeling is that assessment can be much broader,

much more humane than it is now, and that psychologists should spend less time ranking people and more time trying to help them.

"Bestist" is a not very veiled reference to a book by David Halberstam called *The Best and the Brightest*. Halberstam referred ironically to figures such as Harvard faculty members who were brought to Washington to help John F. Kennedy and in the process launched the Vietnam War. I think that any belief that all the answers to a given problem lie in one certain approach, such as logical-mathematical thinking, can be very dangerous. One of the leitmotifs of this symposium is the idea that current views of intellect need to be leavened with other points of view.

It is of the utmost importance that we recognize and nurture all of the varied human intelligences, and all of the combinations of intelligences. We are all so different largely because we all have different combinations of intelligences. If we recognize this, I think we will have at least a better chance of dealing appropriately with the many problems that we face in the world. If we can mobilize the spectrum of human abilities, not only will people feel better about themselves and more competent; it is even possible that they will also feel more engaged and more readily able to join with the rest of the world community in working for the broader good. Perhaps if we can mobilize the full range of human intelligences, and ally them to an ethical sense, we can help to increase the likelihood of our survival on this planet, and perhaps even contribute to our thriving.