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Dear Dr. Marlowe:

Student teaching is great, but teaching high school is challenging. I swear some of these kids are smarter than me. But, then there's Ben. My cooperating teacher has made him my "project" and I have to tell you it's been pretty challenging. Looking through all the paperwork that's accumulated over the years on this guy is daunting. In different years, he's been labeled as learning disabled, mentally retarded, language impaired, and probably other stuff I haven't even gotten to yet.

When I work with him individually, it's clear that he does have difficulty expressing himself and his writing is atrocious. Besides the handwriting, which is basically illegible, he can't even write in complete sentences. I don't know how he ever got to 10th grade. His reading is pretty sketchy too. But, the thing is, he's got some talent. For example, if you ask him about clocks or watches or car engines or virtually anything mechanical he can tell you everything about it and he can draw all the inner workings of these things. It's uncanny. Sort of like those David Macaulay drawings. Really detailed, precise. His eyes light up when he does that sort of stuff and my cooperating teacher told me that Ben can also repair just about anything, including transmissions. I'm not really sure what to do with this guy because I'm a mechanical klutz to begin with and anyway shouldn't a kid like this be in voc-tech? He doesn't really seem to be smart enough for the regular high school curriculum. Am I just off base here?

Sarah Johnson

❖ HOW WOULD YOU RESPOND?

What does it mean to be smart? Is it possible for one to be "book smart" and lack common sense? How is intelligence measured? Is there a common understanding of what intelligence is, or might people in Polynesia, Brazil, and China each have a different understanding about what it means to be intelligent? Students can learn to be better readers; can they learn to become more intelligent or is this something fixed, like eye color? What teacher behaviors might foster intellectual growth? Keep these questions in mind as you read Kathy Checkley's interview with Howard Gardner. What questions do you have about intelligence? How can you help extend the discussion of these ideas in class? Finally, how would you respond to Sarah Johnson?

❖ THE FIRST SEVEN . . . AND THE EIGHTH:
A CONVERSATION WITH HOWARD GARDNER

Kathy Checkley

Howard Gardner's theory of multiple intelligences, described in *Frames of Mind* (1985), sparked a revolution of sorts in classrooms around the world, a mutiny against the notion that human beings have a single, fixed intelligence. The fervor with which educators embraced his premise that we have multiple intelligences surprised Gardner himself. "It obviously spoke to some sense that people had that kids weren't all the same and that the tests we had only skimmed the surface about the differences among kids," Gardner said.

Here Gardner brings us up-to-date on his current thinking on intelligence, how children learn, and how they should be taught.

How do you define intelligence?

Intelligence refers to the human ability to solve problems or to make something that is valued in one or more cultures. As long as we can find a culture that values an ability to solve a problem or create a product in a particular way, then I would strongly consider whether that ability should be considered an intelligence.

First, though, that ability must meet other criteria: Is there a particular representation in the brain for the ability? Are there populations that are especially good or especially impaired in an intelligence? And, can an evolutionary history of the intelligence be seen in animals other than human beings?

I defined seven intelligences (see box) in the early 1980s because those intelligences all fit the criteria. A decade later when I revisited the task, I found at least one more ability that clearly deserved to be called an intelligence.

The Intelligences, in Gardner's Words

- Linguistic intelligence is the capacity to use language, your native language, and perhaps other languages, to express what's on your mind and to understand other people. Poets really specialize in linguistic intelligence, but any kind of writer, orator, speaker, lawyer, or a person for whom language is an important stock in trade highlights linguistic intelligence.
- People with a highly developed logical-mathematical intelligence understand the underlying principles of some kind of a causal system, the way a scientist or a logician does; or can manipulate numbers, quantities, and operations, the way a mathematician does.
- Spatial intelligence refers to the ability to represent the spatial world internally in your mind—the way a sailor or airplane pilot navigates the large spatial world, or the way a chess player or sculptor represents a more circumscribed spatial world. Spatial intelligence can be used in the arts or in the sciences. If you are spatially intelligent and oriented toward the arts, you are more likely to become a painter or a sculptor or an architect than, say, a musician or a writer. Similarly, certain sciences like anatomy or topology emphasize spatial intelligence.

- Bodily kinesthetic intelligence is the capacity to use your whole body or parts of your body—your hand, your fingers, your arms—to solve a problem, make something, or put on some kind of a production. The most evident examples are people in athletics or the performing arts, particularly dance or acting.

- Musical intelligence is the capacity to think in music, to be able to hear patterns, recognize them, remember them, and perhaps manipulate them. People who have a strong musical intelligence don't just remember music easily—they can't get it out of their minds, it's so omnipresent. Now, some people will say, "Yes, music is important, but it's a talent, not an intelligence." And I say, "Fine, let's call it a talent." But, then we have to leave the word *intelligent* out of all discussions of human abilities. You know, Mozart was damned smart!
- Interpersonal intelligence is understanding other people. It's an ability we all need, but is at a premium if you are a teacher, clinician, salesperson, or politician. Anybody who deals with other people has to be skilled in the interpersonal sphere.
- Intrapersonal intelligence refers to having an understanding of yourself, of knowing who you are, what you can do, what you want to do, how you react to things, which things to avoid, and which things to gravitate toward. We are drawn to people who have a good understanding of themselves because those people tend not to screw up. They tend to know what they can do. They tend to know what they can't do. And they tend to know where to go if they need help.
- Naturalist intelligence designates the human ability to discriminate among living things (plants, animals) as well as sensitivity to other features of the natural world (clouds, rock configurations). This ability was clearly of value in our evolutionary past as hunters, gatherers, and farmers; it continues to be central in such roles as botanist or chef. I also speculate that much of our consumer society exploits the naturalist intelligences, which can be mobilized in the discrimination among cars, sneakers, kinds of makeup, and the like. The kind of pattern recognition valued in certain of the sciences may also draw upon naturalist intelligence.

That would be the naturalist intelligence. What led you to consider adding this to our collection of intelligences?

Somebody asked me to explain the achievements of the great biologists, the ones who had a real mastery of taxonomy, who understood about different species, who could recognize patterns in nature and classify

objects. I realized that to explain that kind of ability, I would have to manipulate the other intelligences in ways that weren't appropriate.

So I began to think about whether the capacity to classify nature might be a separate intelligence. The naturalist ability passed with flying colors. Here are a couple of reasons: First, it's an ability we need to survive as human beings. We need, for example, to know which animals to hunt and which to run away from. Second, this ability isn't restricted to human beings. Other animals need to have a naturalist intelligence to survive. Finally, the big selling point is that brain evidence supports the existence of the naturalist intelligence. There are certain parts of the brain particularly dedicated to the recognition and the naming of what are called "natural" things.

How do you describe the naturalist intelligence to those of us who aren't psychologists?

The naturalist intelligence refers to the ability to recognize and classify plants, minerals, and animals, including rocks and grass and all variety of flora and fauna. The ability to recognize cultural artifacts like cars or sneakers may also depend on the naturalist intelligence.

Now, everybody can do this to a certain extent—we can all recognize dogs, cats, trees. But, some people from an early age are extremely good at recognizing and classifying artifacts. For example, we all know kids who, at age 3 or 4, are better at recognizing dinosaurs than most adults.

Darwin is probably the most famous example of a naturalist because he saw so deeply into the nature of living things.

Are there any other abilities you're considering calling intelligences?

Well, there may be an existential intelligence that refers to the human inclination to ask very basic questions about existence. Who are we? Where do we come from? What's it all about? Why do we die? We might say that existential intelligence allows us to know the invisible, outside world. The only reason I haven't given a seal of approval to the existential intelligence is that I don't think we have good brain evidence yet on its existence in the nervous system—one of the criteria for an intelligence.

You have said that the theory of multiple intelligences may be best understood when we know what it critiques. What do you mean?

The standard view of intelligence is that intelligence is something you are born with; you have only a certain amount of it; you cannot do much about how much of that intelligence you have; and tests exist that can tell you how smart you are. The theory of multiple intelligences challenges that view. It asks, instead, "Given what we know about the brain, evolution, and the differences in cultures, what are the sets of human abilities we all share?"

My analysis suggested that rather than one or two intelligences, all human beings have several (eight) intelligences. What makes life interesting, however, is that we don't have the same strength in each intelligence area, and we don't have the same amalgam of intelligences. Just as we look different from one another and have different kinds of personalities, we also have different kinds of minds.

This premise has very serious educational implications. If we treat everybody as if they are the same, we're catering to one profile of intelligence, the language-logic profile. It's great if you have that profile, but it's not great for the vast majority of human beings who do not have that particular profile of intelligence.

Can you explain more fully how the theory of multiple intelligences challenges what has become known as IQ?

The theory challenges the entire notion of IQ. The IQ test was developed about a century ago as a way to determine who would have trouble in school. The test measures linguistic ability, logical-mathematical ability, and, occasionally, spatial ability.

What the intelligence test does not do is inform us about our other intelligences; it also doesn't look at other virtues like creativity or civic mindedness, or whether a person is moral or ethical.

We don't do much IQ testing anymore, but the shadow of IQ tests is still with us because the SAT—arguably the most potent examination in the world—is basically the same kind of disembodied language-logic instrument.

The truth is, I don't believe there is such a general thing as scholastic aptitude. Even so, I don't think that the SAT will fade until colleges indicate that they'd rather have students who know how to use their minds well—students who may or may not be good test takers, but who are serious, inquisitive, and know how to probe and problem-solve. That is really what college professors want, I believe.

Can we strengthen our intelligences? If so, how?

We can all get better at each of the intelligences, although some people will improve in an intelligence area more readily than others, either because biology gave them a better brain for that intelligence or because their culture gave them a better teacher.

Teachers have to help students use their combination of intelligences to be successful in school, to help them learn whatever it is they want to learn, as well as what the teachers and society believe they have to learn.

Now, I'm not arguing that kids shouldn't learn the literacies. Of course they should learn the literacies. Nor am I arguing that kids shouldn't learn the disciplines. I'm a tremendous champion of the disciplines. What I argue against is the notion that there's only one way to learn how to read, only one way to learn how to compute, only one way to learn about biology. I think that such contentions are nonsense.

It's equally nonsensical to say that everything should be taught seven or eight ways. That's not the point of the MI theory. The point is to realize that any topic of importance, from any discipline, can be taught in more than one way. There are things people need to know, and educators have to be extraordinarily imaginative and persistent in helping students understand things better.

A popular activity among those who are first exploring multiple intelligences is to construct their own intellectual profile. It's thought that when teachers go through the process of creating such a profile, they're more likely to recognize and appreciate the intellectual strengths of their students. What is your view on this kind of activity?

My own studies have shown that people love to do this. Kids like to do it, adults like to do it. And, as an activity, I think it's perfectly harmless.

I get concerned, though, when people think that determining your intellectual profile—or that of someone else—is an end in itself.

You have to use the profile to understand the ways in which you seem to learn easily. And, from there, determine how to use those strengths to help you become more successful in other endeavors. Then, the profile becomes a way for you to understand yourself better, and you can use that understanding to catapult yourself to a better level of understanding or to a higher level of skill.

How has your understanding of the multiple intelligences influenced how you teach?

My own teaching has changed slowly as a result of multiple intelligences because I'm teaching graduate students psychological theory and there are only so many ways I can do that. I am more open to group work and to student projects of various sorts, but even if I wanted to be an "MI professor" of graduate students, I still have a certain moral obligation to prepare them for a world in which they will have to write scholarly articles and prepare theses.

Where I've changed much more, I believe, is at the workplace. I direct research projects and work with all kinds of people. Probably 10 to 15 years ago, I would have tried to find people who were just like me to work with me on these projects.

I've really changed my attitude a lot on that score. Now I think much more in terms of what people are good at and in putting together teams of people whose varying strengths complement one another.

How should thoughtful educators implement the theory of multiple intelligences?

Although there is no single MI route, it's very important that a teacher take individual differences among kids very seriously. You cannot be a good MI teacher if you don't want to know each child and try to gear how you teach and how you evaluate to that particular child. The bottom line is a deep interest in children and how their minds are different from one another, and in helping them use their minds well.

Now, kids can be great informants for teachers. For example, a teacher might say, "Look, Benjamin, this obviously isn't working. Should we try using a picture?" If Benjamin gets excited about that approach, that's a pretty good clue to the teacher about what could work.

The theory of multiple intelligences, in and of itself, is not going to solve anything in our society, but linking the multiple intelligences with a curriculum focused on understanding is an extremely powerful intellectual undertaking.

When I talk about understanding, I mean that students can take ideas they learn in school, or anywhere for that matter, and apply those appropriately in new situations. We know people truly understand something when they can represent the knowledge in more than one way. We have to put understanding up front in school. Once we have that goal, multiple intelligences can be a terrific handmaiden because understandings involve a mix of mental representations, entailing different intelligences.

People often say that what they remember most about school are those learning experiences that were linked to real life. How does the theory of multiple intelligences help connect learning to the world outside the classroom?

The theory of multiple intelligences wasn't based on school work or on tests. Instead, what I did was look at the world and ask, What are the things that people do in the world? What does it mean to be a surgeon? What does it mean to be a politician? What does it mean to be an artist or a sculptor? What abilities do you need to do those things? My theory, then, came from the things that are valued in the world.

So when a school values multiple intelligences, the relationship to what's valued in the world is patent. If you cannot easily relate this activity to something that's valued in the world, the school has probably lost the core idea of multiple intelligences, which is that these intelligences evolved to help people do things that matter in the real world. School matters, but only insofar as it yields something that can be used once students leave school.

How can teachers be guided by multiple intelligences when creating assessment tools?

We need to develop assessments that are much more representative of what human beings are going to have to do to survive in this society. For example, I value literacy, but my measure of literacy should not be whether you can answer a multiple-choice question that asks you to select the best meaning of a paragraph. Instead, I'd rather have you read the paragraph and list four questions you have about the paragraph and figure out how you would answer those questions. Or, if I want to know how you can write, let me give you a stem and see whether you can write about that topic, or let me ask you to write an editorial in response to something you read in the newspaper or observed on the street.

The current emphasis on performance assessment is well supported by the theory of multiple intelligences. Indeed, you could not really be an advocate of multiple intelligences if you didn't have some dissatisfaction with the current testing because it's so focused on short-answer, linguistic, or logical kinds of items.

MI theory is very congenial to an approach that says: one, let's not look at things through the filter of a short-answer test. Let's look directly at the performance that we value, whether it's a linguistic, logical,

aesthetic, or social performance; and, two, let's never pin our assessment of understanding on just one particular measure, but let's always allow students to show their understanding in a variety of ways.

You have identified several myths about the theory of multiple intelligences. Can you describe some of those myths?

One myth that I personally find irritating is that an intelligence is the same as a learning style. Learning styles are claims about ways in which individuals purportedly approach everything they do. If you are playful, you are supposed to be playful about everything. If you are logical-sequential, you are supposed to be logical-sequential about everything. My own research and observations suggest that that's a dubious assumption. But whether or not that's true, learning styles are very different from multiple intelligences.

Multiple intelligences claims that we respond, individually, in different ways to different kinds of content, such as language or music or other people. This is very different from the notion of learning style.

You can say that a child is a visual learner, but that's not a multiple intelligences way of talking about things. What I would say is, "Here is a child who very easily represents things spatially, and we can draw upon that strength if need be when we want to teach the child something new."

Another widely believed myth is that, because we have seven or eight intelligences, we should create seven or eight tests to measure students' strengths in each of those areas. That is a perversion of the theory. It's re-creating the sin of the single intelligence quotient and just multiplying it by a larger number. I'm personally against assessment of intelligences unless such a measurement is used for a very specific learning purpose—we want to help a child understand her history or his mathematics better and, therefore, want to see what might be good entry points for that particular child.

What experiences led you to the study of human intelligence?

It's hard for me to pick out a single moment, but I can see a couple of snapshots. When I was in high school, my uncle gave me a textbook in psychology. I'd never actually heard of psychology before. This textbook helped me understand color blindness. I'm color blind, and I became fascinated by the existence of plates that illustrated what color blindness was. I could actually explain why I couldn't see colors.

Another time when I was studying the Reformation, I read a book by Erik Erikson called *Young Man Luther* (1958). I was fascinated by the psychological motivation of Luther to attack the Catholic Church. That fascination influenced my decision to go into psychology.

The most important influence was actually learning about brain damage and what could happen to people when they had strokes. When a person has a stroke, a certain part of the brain gets injured, and that injury can tell you what that part of the brain does. Individuals who lose their musical abilities can still talk. People who lose their linguistic ability still might be able to sing. That understanding not only brought me into the whole world of brain study, but it was really the seed that led ultimately to the theory of multiple intelligences. As long as you can lose one ability while others are spared, you cannot just have a single intelligence. You have to have several intelligences.

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Dear Professor Canestrari:

I don't know if you remember me but I had you in a foundations of ed class. Since graduation, I've been teaching fourth grade for the last four years and, well, actually, I'm thinking about quitting and it reminded me of a conversation we had in your class about teachers needing to take a stand. So, I guess I'm trying to decide about taking a stand or simply doing something less stressful.

The thing that's been really bothering me is that it seems as if kids, in my building anyway, are getting asked to answer questions in the same way. It's like the district makes a big fuss about how we should come up with all these interesting activities and questions to do with kids in our classes but at the same time they want the kids to all have the same answer in the same format. Is this a good idea? Shouldn't we be encouraging all sorts of answers and approaches to solving problems? Even my principal, who I like, wants us to make sure the kids all do their math problems in a certain way and all do their writing a certain way. Even the art teacher is being asked to evaluate her kids' painting based on a rubric where each kid is compared to the same criteria. Doesn't this squash individuality? What if a kid comes up with a painting style that doesn't fit? Do we really want to say the painting's no good or inadequate? What if it's really just so original? I don't know anymore but when I started it seemed like there was a lot more room for kids to explore and be creative and now it all seems so narrow. Do you think I'm being silly? Is this something you think is worth taking a stand about?

Alice Chen