Chapter 1

MI Basics
Julie Viens

It's early evening in Salisbury, Massachusetts, and the GED preparation class is in full swing. Working alone or in pairs, the students use rulers, play dough, drawing materials, measuring spoons, even a xylophone, to complete three measuring tasks of their choosing from the ten diverse options Martha Jean, their teacher, has provided. One student measures and cuts strips of paper; another measures her partner's height, while a pair measure and compare differing amounts of water and play dough. Lively discussions about inches, gallons, and long and short musical notes create a welcomed din to Martha's ears.

In Providence, Rhode Island, Terri Coustan's low literacy ESOL students are completing entries in their dialogue journals. Because her students had responded enthusiastically to visual media in the past, Terri has begun including in the journals photographs of each student at work in the classroom. The journals are an important part of Terri's attempts to help her students' reflect on their own learning. Watching her students so engaged with the photos and intently writing journal responses, Terri is encouraged. She feels she has found one strategy to help circumvent the significant language barrier that has obstructed her previous attempts at guiding her students' self-reflection.

Not far from Terri's classroom, at Providence's Dorcas Place, Lezlie Rocka teaches a basic literacy class. One student stands and reads dramatically from a book. Later each student traces the travels of Sojourner Truth, the book's main character, on individual maps. At another point they sketch pictures of a scene as they imagine it. What we are observing is Lezlie's unorthodox approach to student read-aloud. Lezlie has devised several diverse, hands-on activities, tied to the plot and theme of the readings, which she intermingles with student readings. For Lezlie, these activities help build her students' reading comprehension. For the students, it is a fun and engaging way to learn to read.

Which of these teachers is using multiple intelligences theory to inform her practice? All three, as you have likely guessed. But if it's all three, then why does each practice seem so distinct from the other? Because MI is a theory of intelligence, rather than a
specific approach or set of teaching strategies to be applied directly. MI serves as a common theoretical root that results in many different practices.

The teacher researchers of the Adult Multiple Intelligences (AMI) Study --including the three above-- used MI-based applications of their own design and choosing. Each used MI theory in ways that made sense for her circumstances and developed applications that addressed “local” goals and needs. With MI theory as the foundation, there emerged many commonalities across AMI practices. Given the diversity of students and teaching contexts, there also emerged substantive differences across AMI and other MI-informed practices.

Whatever the practical outcome, the AMI teachers, like many teachers before and after them, began with the basics, asking "What is the theory of multiple intelligences? What are the major features of MI theory with implications for the classroom? What are those implications of MI theory?" Beginning with these initial queries, the AMI teachers tried first to understand MI theory well, in order to develop appropriate applications that fit their needs while remaining consonant with MI theory.

The goal of this chapter is to provide those "basics" of MI theory: what it is and in what ways it can inform practice. The chapter is organized in two parts. Part I provides the theoretical basics, including: contrasting MI theory with traditional "IQ" definitions of intelligence, a description of each intelligence, and features of MI theory that have implications for the classroom. Part II provides an overview of how MI theory is put to practice, highlighting examples from our AMI classrooms. Final Reflection Questions at the end of the chapter are meant both to help readers check their understanding of MI theory and begin to consider how MI might find its way to their classroom.

PART I
MULTIPLE INTELLIGENCES: THE THEORY BEHIND THE PRACTICE

The Traditional View
The traditional view of intelligence can be traced to French psychologist Alfred Binet. At the request of the French Ministry of Education in the early 1900s, Binet and his colleague Theodore Simon developed a test that identified children at risk for school failure. The test was effective for that purpose. However it was soon used as the basis for the psychometric measurement of individuals' general capabilities or intelligence. Since that time, intelligence tests have been heavily weighted toward the types of highly predictive abilities Binet measured in his test, including: verbal memory, verbal reasoning, numerical reasoning, and appreciation of logical sequences.

Much of the text for this section, the “the Eight Intelligences” draws from H. Gardner (1999), Intelligences Reframed.
In 1912 German psychologist Wilhelm Stern came up with the Intelligence Quotient, or "IQ" which represents the ratio of one's mental age to one's chronological age, as measured by intelligence tests. Lewis Terman, an American psychometrician, is credited (or blamed, as the case may be) for popularizing the IQ test in the U.S starting in the 1920s. It is Terman who introduced the Standford-Binet IQ tests, the first paper and pencil, group-administered versions of the test.

In a large part due to Terman's work, the intelligence test quickly became a standard part of the U.S. educational landscape. Since that time, conventional wisdom has equated intelligence with this psychometric view. Terman's work also had a significant role in the development of two additional beliefs in the conventional view of intelligence: that it is inherited and largely unchangeable. Thus, current conventional wisdom about intelligence includes three main dimensions: that intelligence is testable, genetic, and unitary. In other words, the proverbial “man on the street” would say the following: Intelligence is measured by a test. You inherit your intelligence from your parents and are born with whatever intelligence you will ever possess. Intelligence is one general capacity, and therefore we can all be measured against the same yardstick, plotted on a single line somewhere between "very stupid" and "highly gifted."

I recent years IQ tests have seen declining use. Legal battles have made public schools back away from them. For the most part IQ-testing is limited to cases where there is a problem, like a suspected learning disability; or to selection procedures, like entry into a gifted program. However, the line of thinking that intelligence testing gave rise to maintains a powerful presence. Most directly, any academic measures are thinly disguised intelligence tests. Most pervasively, the traditional view of intelligence is societally internalized and thus directs teaching and learning practices. The traditional view of intelligence has played a significant role in determining standard school fare, with its emphasis on the same narrow set of language and math skills that harken back to test items. “Core curricula” as well as determinants of who are the “good” or “smart” students find their roots in this long-held view of intelligence.

A New View
Gardner was certainly not the first to take issue with IQ tests and the notion of intelligence that they support. Criticisms emerged from the inception of intelligence testing, particularly when IQ tests first hit the U.S. educational scene in the 1920s. The influential American journalist Walter Lippman took Lewis Terman to task in a series of debates that were published in the New Republic. He criticized the superficiality of the test items, the risks of assessing intellectual potential through a single, brief method, and he pointed out possible cultural biases. However, nothing really changed. As Gardner notes,

So long as these tests continued to do what they were supposed to do--that is, yield reasonable predictions about people's success in school--it did not seem necessary or prudent to probe too deeply into their meanings or to explore alternative views of what intelligence is or how it might be assessed. (1999, p. 13)
It is in his own work in neuropsychology and development that Gardner began to question the traditional view of intelligence. In the 70s and 80s he worked in two contexts studying the nature of human cognitive capacities. At the Boston University Aphasia Research Center, Gardner conducted studies to understand the pattern of abilities of stroke victims suffering from impaired language and other kinds of cognitive and emotional injury. At the same time, Gardner worked with ordinary and gifted children at Project Zero, in an attempt to understand the development of cognitive abilities. Gardner observed something different, not explained by the psychometric view of intelligence. He noted,

The daily opportunity to work with children and with brain-damaged adults impressed me with one brute fact of human nature: People have a wide range of capacities. A person's strength in one area of performance simply does not predict any comparable strengths in other areas.

In most cases, however, strengths are distributed in a skewed fashion. For instance, a person may be skilled in acquiring foreign languages, yet be unable to find her way around an unfamiliar environment or learn a new song or figure out who occupies a position of power in a crowd of strangers. Likewise, weakness in learning foreign languages does not predict either success or failure with most other cognitive tasks (1999, p. 31).

Both groups with which he worked sent Gardner the same message:

...the human mind is better thought of as a series of relatively separate faculties, with only loose and non-predictable relations with one another, than a single, all-purpose machine that performs steadily at a certain horsepower, independent of content and context.(1999, p. 32)

Most theories of intelligence looked only at problem-solving and ignored the creation of products. They also assumed that their notion of “intelligence” would be apparent and appreciated anywhere, regardless of cultural values and beliefs. In this respect, Gardner distinguished his theory of intelligence from others by defining intelligence as “the ability to solve problems or to create products that are valued within one or more cultural settings."

figure 1. MI theory's definition of intelligence

Intelligence is the biological potential to process information in certain ways that can be activated in a cultural setting to solve problems or make products that are value in a culture.

Gardner's recently refined definition (figure 1) suggests that intelligence represents potential that will or will not be brought to bear depending on the values, available
opportunities, as well as personal decisions made by individuals, of a particular culture (Gardner, 1999, p. 34).

Gardner's definition located intelligence in what people can do and the products they create in the real world, in contrast to the implied intelligence enumerated through a test. It suggests a qualitative expression, a description, of an individual's collection of intelligences rather than a quantitative expression of a unitary ability.

**figure 2. The Eight Intelligences**

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<tbody>
<tr>
<td>Linguistic</td>
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<td>Naturalist</td>
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**Identifying intelligences**

If there are qualitatively different ways to express intelligence, then how does one characterize each of these separate faculties? To determine and articulate these separate faculties, or “intelligences,” Gardner turned to discrete disciplinary lenses in his initial investigations, including psychology, neurology, biology, sociology, and anthropology, and the arts and humanities. Gardner and his colleagues looked at the many abilities individuals demonstrate and the diverse roles they assume and asked, "What are the basic biological faculties responsible for these abilities that we observe around us every day."

Gardner's "new view" of intelligence gave rise to a list of eight criteria used to identify these basic biological faculties (figure 3). That is, rather than relying primarily on the results of psychometric instruments, Gardner laid out eight criteria that require different kinds of evidence from brain research, human development, evolution, and cross-cultural comparisons before candidate abilities could be considered an "intelligence." With varying amounts and quality of research on the different candidate abilities, Gardner and his colleagues asked whether an ability met the set of criteria “reasonably well.” If it did, it was designated an intelligence. If the ability did not meet the criteria reasonably well, then it might be set aside, or recast and re-investigated against the criteria.

Gardner initially identified seven intelligences that satisfactorily fulfilled the criteria. An eighth intelligence, naturalist, has since been added. A ninth, existential ability, is currently under consideration (see Gardner, 1999, Chapter 4). The next section introduces each of the criterion, using examples from the current list of intelligences.
The Eight Criteria for Identifying an Intelligence  
(Gardner, 1993 & 1999)

- potential isolation by brain damage/neurological evidence
- evolutionary history and evolutionary plausibility
- an identifiable set of core operation(s)
- susceptibility to encoding in a symbol system
- recognizable end-state and distinctive developmental trajectory
- existence of savants, prodigies, and other individuals distinguished by the presence or absence of specific abilities
- support from experimental psychological tasks
- support from psychometric findings

Potential Isolation by Brain Damage
This criteria calls for neuropsychological evidence that one intelligence can be isolated from others at the basic brain level. The extent to which a specific ability is destroyed or spared as a result of brain damage, such as with stroke patients, gives us a great deal of information about the basic nature of abilities. In Gardner’s words:

> Every stroke represents an accident of nature from which the careful observer can learn much. Suppose, for example, one wants to study the relation between the ability to speak fluently and the ability to sing fluently. One can mount arguments indefinitely about the relatedness or the independence of these faculties, but the facts of brain damage actually resolve the debate. Human singing and human language are different faculties that can be independently damaged or spared. Paradoxically, however, human signing and human speaking are similar faculties. Those parts of the brain that subserve spoken language in hearing people are (roughly speaking) the same parts of the brain that subserve sign language in deaf people. So here we encounter an underlying linguistic faculty that cuts across sensory and motor modalities (1999, p. 30).

The relative autonomy of musical intelligence is strongly indicated by cases of brain injury in which musical ability is preserved, but other abilities, such as language, are lost. The existence and independence of the musical and linguistic intelligences are supported by the identification of brain centers that mediate linguistic and musical processing. Specific areas of the brain have been identified as playing important roles in music perception and production.

Evolutionary history and evolutionary plausibility
Evolutionary evidence is central to any understanding of human cognition or intelligence. The existence of an intelligence is indicated by the extent to which some evolutionary antecedents can be determined in other species. For example, the highly developed spatial capacities of other mammals can be mined for evidence of a spatial intelligence. More recent work in evolutionary psychology looks at contemporary workings of human
capacities and then tries to infer the selection pressures that led to the development of a particular faculty.

We see evidence in early man for the identification of a naturalist intelligence, that is, the understanding and use of flora and fauna. Evolutionary evidence for musical intelligence is drawn from its apparent unifying role in Stone Age societies, as well as its link to other species (i.e. birdsong). All identified societies have demonstrated evidence of some form of musical activity within their culture.

An identifiable set of core operation(s)
While the first two criteria come from the biological sciences, this one and the next are based on logical analysis. Although specific intelligences operate in rich contexts, usually in combination with other intelligences, it is helpful to isolate capacities that seem “core” to an intelligence. These capacities are likely to be triggered by relevant internal or external types of information. For example, linguistic intelligence includes the core operations of phonemic discrimination, a command of syntax, sensitivity to the pragmatic uses of language, and acquisition of word meanings. The core operations of spatial intelligence include sensitivity to large-scale, local, three- and two-dimensional spaces, while the core operations that trigger musical ability include sensitivity to pitch, rhythm, and timbre.

Susceptibility to encoding in a symbol system
Human beings spend a great deal of time learning and using different kinds of symbol systems. Our primary communications occur through symbol systems like written and spoken language, mathematical systems such as logical equations, and picturing (e.g., charts, graphs). Over time people developed these symbol systems to communicate information in an organized and accurate manner. Indeed, symbol systems seem to have arisen to code those meanings to which human intelligences are most sensitive. Therefore, a fundamental characteristic of intelligence seems to be a susceptibility to embodiment in a symbolic system. Musical notation is another example of a distinct symbol system.

A distinct developmental history, along with a definable set of expert "end-state" performances.
This is the first of two criteria that come from developmental psychology. Intelligences are not demonstrated “in the raw.” Rather, they operate within different domains and “adult endstates.” For example, musical intelligence is expressed in several “end states,” including musician, composer, and sound engineer within the domain of music.

Individuals exhibit their intelligences after proceeding through a developmental process, most likely specific to that end-state. Both the musician and sound engineer will develop their musical intelligence, along the developmental path needed for their respective endstates (musician, sound engineer). In a sense, intelligences have their own developmental histories. Thus, an individual who wants to be a softball player must develop her abilities in ways distinct from the aspiring dancer. Other people must follow
distinctive developmental paths to become, for instance, clinicians or clergymen, each with well-developed interpersonal intelligence.

It is important to assume a cross-cultural perspective because an intelligence may be brought to bear in cultures that exhibit quite different roles and values. For example, both the clinician in American culture and the shaman in a tribal culture are using their interpersonal intelligences but in different ways and for somewhat different ends (Gardner, 1999, p.p.38-39). Like other intelligences, a developmental scale –ranging from novice to expert- can be articulated for a developing naturalist.

Existence of savants, prodigies, and other individuals distinguished by the presence or absence of specific abilities.

Individuals who have unusual profiles of intelligence offer another area to explore in identifying intelligences. These profiles often include high level ability in an isolated area of ability, suggesting that that particular ability may be an intelligence.

Savants, prodigies and autistic individuals exhibit a high level of ability in one area while other abilities are typically ordinary (savants and prodigies), or severely impaired (autistics). Many autistic children, for example, possess outstanding abilities in areas like calculations, musical performance and drawing. At the same time they demonstrate severe impairments in communication, language, and sensitivity to others.

Like autism, prodigious ability tends to show up in domains that are rule-governed and that require little life experience, such as chess, mathematics, representational drawing, and other forms of pattern recognition and reproduction. Prodigies also demonstrate relative weaknesses in other domains. Each of these groups –savants, autistics, and prodigies and gifted children- provides evidence as to which abilities have a biological basis and operate relatively independently.

Support from experimental psychological tasks

Traditional psychology is the source for these last two criteria. Using experimental psychological tasks, researchers can understand the extent to which two operations are related to each other by observing how well individuals can carry out activities from each operation simultaneously. If one activity does not interfere with the successful completion of the other, then we can assume that the activities draw on distinct capacities. For example, most individuals are able to walk while they talk. In that case, the intelligences involved are separate. On the other hand, most people find it hard to talk while working on a crossword puzzle or listening to a song with lyrics. In this case, linguistic intelligence comes to the fore for both tasks. Studies of transfer or task interference can help us to identify discrete intelligences.

Support from psychometric findings

A high correlation between certain subtests on standardized tests suggest a single intelligence at work, while low correlation suggests separate intelligences. Therefore one can say that much current psychometric evidence is a criticism of MI theory, presenting a
correlation in scores among various tasks, which suggest "g", or a general or unitary intelligence. However, as psychologists have broadened their definitions of intelligence and added to their measuring tools, psychometric evidence has emerged favoring MI. More recent studies of spatial and linguistic intelligences strongly suggest that these two areas are relatively separate, having at best only a weak correlation. Similar measures of musical acuity can be teased apart from other tasks, thus supporting the identification of a separate musical intelligence. Studies of social intelligence have revealed a set of capacities different from standard linguistic and logical intelligences.

The criteria are still in use as new candidate intelligences are considered, such as existential abilities. The existential capacity remains under consideration for designation as an intelligence. It refers to the human inclination to ask very basic questions about existence (Who are we? Where do we come from?). Existential ability finds a home in mythology and philosophy, and among issues that are too big, too grand, or infinitesimal. At this time, this ability does not sufficiently meet the criteria to be considered an intelligence (Gardner, 1999, Chapter 4). In particular, the brain evidence (criteria 1) is not compelling. The question remains as to whether existential abilities are not an amalgam of logical and linguistic intelligences.

The criteria have served well as the principal means to identify a set of intelligences that captures a reasonably complete range of abilities that are valued by human cultures. By keeping the criteria in active use, MI theory can and has been modified to reflect our increasing understanding of the ways in which people are intelligent. MI theory offers the most accurate description to date of intelligence in the real world, and it continues to be a helpful articulation and organization of human abilities.

THE EIGHT INTELLIGENCES

At present eight intelligences --eight qualitatively independent ways to be intelligent—have been identified. Each intelligence is different not only neurologically, but in the symbol systems they belong to, the tools they call on, the core or sub-abilities included in each, and how each is utilized in the real world. The next section introduces each of the intelligences. Each is described according to the following categories: key abilities, sub-abilities, domains and endstates, strategies and products, and everyday applications (figure 4). The final category, “Not,” refers to common misconceptions or misunderstandings attributed to the intelligence.
Figure 4. Key to Intelligence Descriptions.

**Key abilities** are broad abilities central to that intelligence.

**Sub-abilities** are the more specific abilities within each of the intelligences.

**Endstates and Domains** refer to societal niches that emphasize that particular intelligence. For example, the journalist endstate requires a great deal of linguistic intelligence. Domains refer to the disciplines of the real world, activities that are valued and at which we can get better. The list below includes domains that require a great deal of that intelligence. (Endstates are realized in domains).

**Everyday Uses:** As our intellectual toolkit, we use our multiple intelligences in combination for everyday activities. This category describes everyday contexts in which the intelligence is heavily drawn on.

"NOT" refers to misconceptions regarding some of the intelligences.
LINGUISTIC INTELLIGENCE

"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 intelligences." -Howard Gardner (Checkley, 1997, Sept. p. 12)

Key Abilities
Linguistic intelligence
…involves perceiving or generating spoken or written language.
…allows communication and sense-making through language.
…includes sensitivity to subtle meanings in language.

Sub-abilities
expressive language, invented narrative/storytelling
descriptive/instructional language, reporting
poetic use of language, wordplay

Endstates or Domains that require significant linguistic intelligence
novelist  stand-up comedian  law
journalist  orator  politics
poet  news correspondence  teaching

Strategies or Products that emphasize linguistic intelligence
instructions/manual  script  word game
novel  newspaper  discussion
debate/speech  play  lyrics/libretto

Everyday uses of linguistic intelligence
reading the paper
writing a letter
participating in a meeting

Linguistic Intelligence is NOT
...bilingualism (but might include facility with learning languages).
...being talkative, liking to talk.
LOGICAL-MATHEMATICAL INTELLIGENCE

"People with 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." -Howard Gardner  (Checkley, 1997, p. 12)

Key Abilities
Logical-mathematical intelligence
...enables individuals to use and appreciate abstract relations.
...includes facility in the use of numbers and logical thinking.

Sub-abilities
numerical reasoning (calculations, estimation, quantification)
logical problem-solving (focusing on overall structure and relationships, making logical inferences)

Endstates or Domains that require significant logical-mathematical intelligence
mathematician  scientist  engineer
computer programmer  architect  stock broker
budget analyst  accountant  statistician

Strategies or Products that emphasize logical-mathematical intelligence
graph  spread sheet  flow chart
timeline  equations/mathematical proof  invention
computer program  business plan  logic puzzle

Everyday uses of logical-mathematical intelligence
Reading the bus schedule
Solving puzzles
managing family checkbook

Logical-mathematical ability is NOT
...only oriented to numbers (and includes non-numerical logical relations).
"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!" --Howard Gardner (Checkley, 1997, p. 12)

Key Abilities
Musical intelligence
...involves perceiving and understanding patterns of sound.
...includes creating and communicating meaning from sound.

Sub-abilities
music perception
music production
composition/notation

Endstates or Domains that require significant musical intelligence
Musician/singer  choreographer  music critics/authors
conductor  disc jockey  piano tuner
composer  choreographer  cheerleader

Strategies or Products that emphasize musical intelligence
composition/song  critique/analysis  jingle
recital/performance  sound effects  musical/opera
dance set to music  recording/sampling  soundtrack/accompaniment

Everyday uses of musical intelligence
appreciating a song on the radio
playing a musical instrument
distinguishing different sounds of the car

Musical intelligence is NOT
...engaged by playing "background" music.
SPATIAL INTELLIGENCE

"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." -Howard Gardner (Checkley, 1997, p. 12)

Key Abilities
Spatial intelligence
...involves perceiving and transforming visual or 3-D information in your mind.
...allows for the re-creation of images from memory.

Sub-abilities
understanding causal or functional relationships through observation
use of spatial information to navigate through space
sensitive perception or observation of visual world and arts
production of visual information or works of art

Endstates or Domains that require significant spatial intelligence
architect       sculptor       surgeon
navigator      cartographer   painter
photographer   dancer         athlete

Strategies or Products that emphasize spatial intelligence
graph/chart     painting       blue prints
diagram         film, TV program map
sculpture       model          invention

Everyday uses of spatial intelligence
finding your way in an unfamiliar town
giving/using directions
playing chess/checkers

Spatial intelligence is not
...necessarily visual (note that blind people gain excellent spatial abilities).
BODILY-KINESTHETIC 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." --Howard Gardner (Checkley, 1997, p. 12)

Key Abilities
Bodily-kinesthetic intelligence
...allows an individual to use one's body to create products or solve problems.
...refers to the ability to control all or isolated parts of one's body.

Sub-abilities
athletic movement
creative movement (including responsiveness to music)
body control and fine motor abilities
generating movement ideas (such as in choreography)

Endstates or Domains that require significant bodily-kinesthetic intelligence
dancer athlete actor
choreographer artisan mime
sculptor surgeon sign language interpreter

Strategies or Products that emphasize bodily-kinesthetic intelligence
dance performance mime sculpture, painting, other arts product
play textiles charades
sports/games jewelry performance art

Everyday uses of bodily-kinesthetic intelligence
playing on the company’s softball team
getting in and standing in a crowded subway car
brushing your teeth
fixing something

Bodily-kinesthetic intelligence is NOT
...necessarily demonstrated by an "antsy" or physically active child.
...unstructured release of "energy" through physical activity.
INTERPERSONAL INTELLIGENCE

"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." --Howard Gardner (Checkley, 1997, p. 12)

Key Abilities
Interpersonal intelligence
...is a sensitivity to the feelings, beliefs, moods, and intentions of other people.
...involves the use of that understanding to work effectively with others.
...includes capitalizing on interpersonal skills in pursuit of one's own ends.

Sub-abilities
assumption of distinctive social roles (e.g., leader, "friend," caregiver)
ability to reflect analytically on the social environment, others
taking "action" (e.g., political activist, counselor, educator)

Endstates or Domains that require significant interpersonal intelligence
educator counselor diplomat
activist social scientist/researcher management consultant
community organizer religious leader negotiator/arbitrator

Strategies or Products that emphasize interpersonal intelligence
tutoring/teaching community action democratic classroom
moral dilemmas action research peer mediation
play community service leadership opportunities

Everyday uses of interpersonal intelligence
retail transactions
asking or giving directions
interactions with co-workers
parenting

Interpersonal intelligence is NOT
...a preference for working in a group.
...being well-liked.
...being polite, possessing the "social graces."
...being ethical or humane
INTRAPERSONAL INTELLIGENCE

"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."
--Howard Gardner (Checkley, 1997, p. 12)

Key Abilities

Intrapersonal intelligence
...enables individuals to form a mental model of themselves.
...involves drawing on the model to make decisions about viable courses of action.
...includes the ability to distinguish one's feelings, moods, and intentions and to anticipate one's reactions to future courses of action.

Sub-abilities

Self-understanding, the ability to self-reflect analytically
articulating that understanding through other types of expression/intelligences (poetry, painting, song, etc.)
using that self-knowledge well, towards personal or community goals

Endstates or Domains that require significant intrapersonal intelligence
therapist poet motivational speaker
psychologist artist activist
spiritual/religious leader musician philosopher

Strategies or Products that emphasize intrapersonal intelligence
genealogy portfolio/reflections sermon
poem journal/diary action plan
artwork autobiography musical composition/lyrics

Everyday uses of intrapersonal intelligence
job/career assessment
religious practices
therapy

Intrapersonal intelligence is NOT
...preferring to work alone and/or in isolation.
"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." -Howard Gardner (Checkley, 1997, p. 12).

Key Abilities
Naturalist intelligence
...is the ability to understand the natural world well and to work in it effectively.
...allows us to distinguish among, classify, and use features of the environment.
...is also applied to general classifying and patterning abilities.

Sub-abilities
observational skills
pattern recognition and classification
knowledge of the natural world
employing that knowledge to solve problems & fashion products (e.g., farming, gardening, hunting/fishing, cooking, etc.)

Endstates or Domains that require significant naturalist intelligence
naturalist zooologist head chef
botanist farmer environmental educator
biologist ship's captain forest ranger

Strategies or Products that emphasize naturalist intelligence
growing plants/flowers surveys of flora/fauna field notes
animal husbandry studies/experiments nature walks
"Outward Bound" creating and using classification systems
(for natural or non-natural phenomena)

Everyday uses of naturalist intelligence
cooking
gardening
enjoying scenery
organizing CDs or other collection

Naturalist intelligence is NOT
...limited to the outside world.
KEY FEATURES OF MI THEORY

Two distinguishing features of MI theory already presented in this chapter set it apart from conventional wisdom. The first is MI's definition of intelligence, which locates intelligence in real world problem-solving and product-making. In contrast to the "implied" view of IQ intelligence, MI is based on an understanding of how people’s intelligences really operate. The second feature is that there exists a plurality of intelligences, each with distinct symbol systems and ways of knowing and processing information. Four other distinguishing features of MI theory which have particular implications for educational practice are presented in this section (figure 5).

Figure 5. Distinguishing Features of MI Theory

<table>
<thead>
<tr>
<th>Distinguishing Features of MI Theory</th>
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<tr>
<td>• Definition of intelligence based on real-world intelligence</td>
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<tr>
<td>• Pluralistic view of intelligence</td>
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<tr>
<td>• All 8 (or more) intelligences are universal</td>
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<tr>
<td>• Unique profiles of intelligence that develop and change</td>
</tr>
<tr>
<td>• Each intelligence involves subabilities or different manifestations</td>
</tr>
<tr>
<td>• Intelligences work in combination, not isolation</td>
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All 8 (or more) intelligences are universal.
MI theory holds that intelligence originates biologically; that is, all human beings are at promise for each of the intelligences. All the intelligences have been identified across all known cultures/societies. This propensity for the intelligences might indeed be considered a significant contributor to what makes us human.

Unique profiles of intelligence.
Although MI theory claims a biological basis of intelligence, this does not suggest that intelligence is purely genetic and inherited. Nature suggests we are all at promise for all the intelligences. How and to what extent the intelligences manifest themselves depend on "nurture" to a significant degree. An individual’s intelligences develop and change; intelligence is not solely inherited and develops based on interaction with our environment. Cultural, societal, and individual factors shape how much you see of a particular intelligence and how it is manifested. For example, in the case of linguistic intelligence, writing might dominate in one context and storytelling in another. A child in the first context whose mother is a reporter and whose home is filled with books, a computer, and writing implements might have more developed writing abilities than a child without those environmental supports. The more time an individual spends using an intelligence, and the better the instruction and resources, the smarter one becomes within that area of intelligence.
Each intelligence involves sub-abilities. No one is simply "musically" or "linguistically" intelligent. One's musical intelligence might be demonstrated through the ability to compose clever tunes or to hear and distinguish instrument parts in a song. In the case of linguistic intelligence, ability might emerge through creative writing, word play (poetry), closing arguments in the courtroom, or acting in a play. Strengths are demonstrated through endstates or domains.

Intelligences work in combination in domains. As described earlier, each intelligence is relatively autonomous in its "raw" state. Each intelligence represents a different way of thinking, solving problems, and learning. Although each intelligence operates relatively independently --that is, the brain has distinct mechanisms and operations for each intelligence-- in reality they work in combination, in the context of a domain or discipline. The distinction between intelligences and domains becomes clear when one considers that effective work in any domain is realized through the use of several intelligences.

Intelligence refers to biological and psychological potential and abilities, whereas domains or disciplines are social constructs. While intelligence is the raw material we bring to bear in solving problems or fashioning products, domains are culturally-organized and valued activities, “in which individuals participate on more than just a casual basis, and in which degrees of expertise can be identified and nurtured” (Gardner, 1999, p. 82). Computer programming, car mechanics, gardening, and soccer are all examples of domains.

For example, violinist needs musical intelligence to be successful, but only in combination with interpersonal abilities, such as communication with other musicians in the orchestra; intrapersonal, such as translating the emotion of the piece; and bodily-kinesthetic, such as the physical act of playing the instrument. Put simply, the musical domain generally requires high levels of musical intelligence, but other intelligences must be tapped to successfully perform in this domain.

Similarly, a particular intelligence like spatial intelligence is not isolated to a specific domain, like the arts. Indeed any particular intelligence can be applied in many domains. In the case of spatial intelligence these abilities come to the fore in the arts, as well as sailing, gardening, even surgery. An individual’s strength in a particular intelligence may manifest itself in one (or more) domains and not others. For example someone with a high level of spatial smarts may have little ability or interest in the artistic domain and may be attracted to more scientific applications of spatial intelligence embedded in, say, biology or topology.
As a theory, MI does not prescribe any particular approach or activities. Rather, classroom practices are based on our understandings of what such a theory of intelligence suggests and how it can inform practice. Just like practices in today's schools are rooted in the conventional wisdom of intelligence, an understanding of intelligence from the perspective of MI theory has its own set of implications for the classroom. In other words the educator asks herself, “If intelligence is as MI theory describes it, then what does that imply for how I set up my classroom, how I approach instruction, and what activities I make available to my students?”

There is indeed no single right way to apply MI theory, but using MI theory as a “lens” or "mind set" in the classroom can and has helped inform excellent, and often quite distinct, teaching and learning practices. Because it is an act of interpretation from a theory of intelligence to actual classroom practices, applying MI theory in the classroom provokes a critical process of practice and reflection on the part of the educator. Teachers decide for themselves how to apply it, reflecting and making revisions and additions along the way.

Many educators have enthusiastically accepted the challenge of creating and implementing applications for MI theory. For many of them, MI theory confirms what they have always believed: that students possess a range of abilities that standard classroom fare neither acknowledges, celebrates, nor nurtures.

This theory provides the means to articulate beliefs about my teaching that I've always held dear, but had a limited vocabulary to express. ...it provides a well-defined vision of the breadth of [students'] strengths and where we might find them (Robert Bickerton, Director of Adult Education, Massachusetts Department of Education, June 1, 2000, personal communication).

**MI GOES TO SCHOOL**

From the AMI Study and other MI-based research efforts (Baum et. al, in press) we can identify at least five approaches teachers take to apply MI theory in their practice (figure 6). There certainly exist other descriptions or characterizations of MI in practice (see Kornhaber & Fierros, 2000), but we have found this one to be inclusive of the range of MI-based practices and a relatively simple, useful way for individuals new to MI theory to understand its practical implications.

We will discuss four of these approaches in this chapter. (A fifth, talent development programs, does not have a proper fit in adult education.) Each approach to using MI theory is described below in terms of its primary objective, the theoretical features of MI
in which the practice is rooted, and examples from AMI teachers and classrooms. Where relevant, myths or misconceptions about MI theory related to that approach are described.

Figure 6. How Teachers Apply MI Theory

<table>
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<tr>
<th>How Teachers Apply MI Theory</th>
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<tr>
<td><strong>MI Reflections</strong></td>
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<tr>
<td>• Using MI theory as a basis to reflect on and identify students' strengths and preferences.</td>
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<tr>
<td>• Emphasizes student participation in MI-based reflections.</td>
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<tr>
<td><strong>Bridging</strong></td>
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<tr>
<td>• Creating a “bridge” from students’ MI strengths to appropriate learning strategies.</td>
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<tr>
<td>• Emphasizes using students’ particular strengths to assist in areas of particular difficulty</td>
</tr>
<tr>
<td><strong>Entry/Exit Points</strong></td>
</tr>
<tr>
<td>• Providing a range of MI-informed “entry points” into a topic and “exit points” for students to demonstrate their learning.</td>
</tr>
<tr>
<td>• Emphasizes using students’ identified strengths to develop entry and exit points.</td>
</tr>
<tr>
<td><strong>Projects</strong></td>
</tr>
<tr>
<td>• Developing project-based curriculum using MI theory as a framework.</td>
</tr>
<tr>
<td>• Emphasizes authentic problems and activities.</td>
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**MI Reflections**

The intelligences describe the “smarts” that students bring to the learning context, with each individual possessing a unique amalgam of intelligences that distinguishes each of us from the other. The focus of an MI Reflections approach to applying MI is getting to know your students through an MI lens; that is, identifying their strengths and interests.

MI theory provides the vocabulary for articulating observations and descriptions of students’ strengths and interests. An MI-based description of students’ preferred intelligences presents a stark contrast to a single-digit “IQ” measurement, particularly in terms of its usefulness (“What do I do with the information?”). With MI theory, the question moves from "How smart are you?" (70, 120) to "How are you smart?" (“I can take anything apart, fix it and put it back together; I have an amazing backhand; I make hats.”).

In the AMI Study, "MI Reflections" referred to strategies or activities that use MI theory to better know and understand students (see Chapter 2, MI Reflections). MI Reflections was applied in two different ways, each with a different emphasis. In one approach the teacher observed her students and identified their strengths and preferences by noting patterns over time in the course of observations. The second approach put students at the
center of the reflection process, with the goal being for the students to “own” their intelligences and see themselves as intelligent people with a variety of abilities.

MI theory says that intelligence is demonstrated in real world contexts, in the problems individuals solve and things they make. Therefore an MI-based perspective on assessment –including the observation and identification of student strengths- would suggest assessment that involves observing individual, amidst authentic uses of their "smarts." AMI teacher Terri Coustan observed her students, jotting down notes that she later organized by student so that she could identify patterns of behavior and preference for each of them. She observed them across a range of activities, including gardening projects, computing, art activities, building projects, and basic literacy activities.

MI theory also claims that intelligence is learnable, you can get smarter. In other words, our profiles of intelligence change. Moreover, a single intelligence can manifest itself across a number of domains. Thus knowing students means watching them grow, get better, and develop new or renewed interests. MI observations might best be described as peering through MI lenses in an ongoing quest to “catch students at their best.” Observations are informal, over time and across different contexts.

The second approach to MI Reflections puts students at the center of the reflection process, allowing them the tools and opportunities for self-reflection and understanding and their own unique collection of strengths and preferences. Basic adult education students often see themselves as failures, having low self-esteem and feelings of incompetence when it comes to school. Teachers use MI to counter this negative self-perception, to bolster students’ self-esteem through reflection activities that identify and validate students’ strengths. Teachers provide different ways for students to understand and articulate their own strengths, such as paper/pencil surveys, journal reflections, or post-activity discussions, and other hands-on activities that call on students to use and reflect on their strengths (see Chapter 2 for examples). With these activities, students are face-to-face with substantive evidence that they are smart and have the tools and knowledge to articulate how.

Several AMI teachers used MI self-reflection surveys and other activities to help students see and believe their intelligences (see Chapter 2, MI Reflections). Meg Costanzo used dialogue journals that included student reflections about their strengths. Wendy Quinones had students debrief about a film they watched together, each drawing on observations based on personal strengths.

Knowing their students from the perspective of their strengths and interests becomes a primary source from which teachers identify learning strategies and activities that map onto students’ strength areas and interests. Any information culled from student reflection activities -that is, students' own understandings of their strengths and preferences- can and should be used to inform the curriculum and instruction. Thus, MI Reflections is also the first step to personalizing instruction and curriculum for students.

**MI reflections myths and misconceptions**
Unfortunately some individuals have translated MI reflections or assessment into introducing 8 (or 9) tests, one for each intelligence, setting MI theory within a conventional understanding of assessing intelligence through paper and pencil tests. This is problematic on at least two fronts. First, it assumes that intelligence can be properly or fully assessed using the paper and pencil, multiple choice mode which reflects a psychometric view of intelligence that we know is contrary to MI theory. Within the framework of MI theory, single paper and pencil test can assess the breadth and depth of any individual’s intelligence.

Second, this misconception assumes that one can come up with a definitive assessment of an individual’s intelligences. It is probably not possible, and certainly not practical, to pursue definitive or final assessments of students’ intelligences. For one, each intelligence includes sub-abilities, each suggesting different ways a student might demonstrate one form of intelligence. Moreover, there are too many different domains in which particular students might demonstrate one or another intelligence. For example, by only looking at art activities, you miss the spatial abilities of the builder or the photographer. In other words, there is too much ground to cover for a truly definitive assessment of any individual’s unique collection of intelligences.

Getting an accurate “reading” of the ways an individual is intelligent would require assessing him using an extensive array of activities, in order to ensure that he has been comprehensively assessed. Still it is likely that an individual would have strengths that any single or small collection of assessments (or observation events) would not gauge. Again, this is a classic case of new wine in an old bottle, an understanding of intelligence as static and measurable is transferred to MI theory.

Another less pervasive but more disconcerting myth is that MI theory validates cultural and racial stereotypes. MI theory is quite to the contrary and serves to disaggregate individuals within the same cultural or racial groupings, rather than aggregating cultural or racial groups by intelligences (and intelligence levels). MI theory should not be used to label one group as naturally better or worse at one intelligence or the other. As human beings, we are all at promise for all intelligences. The form intelligences take might be culturally defined but the extent to which any individual of a given racially or culturally defined group possesses a particular intelligence is not culturally defined. Put simply, race and culture does not determine in what ways and how smart an individual is (Gray & Viens, 1994).

_Bridging_
In some cases, teachers use MI to develop activities and learning strategies that are tailored to students’ strengths. In this case the teacher’s goal is to apply her understanding of MI theory—and of her students’ particular strengths and preferences—to develop different ways to engage students in a particular topic or skill. Teachers are always seeking ways to involve and to reach and teach more of their students. Developing ways to approach a topic or skill area that draw on students’ particular strengths and interests can help them do so. (Approaches based on this bridging idea can be found in Chapter 3, MI-Informed Instruction.)

Using the information culled in MI Reflections, teachers identify related learning strategies for individual or groups of students. For example, Terri Coustan developed musical learning strategies for one student and spatial entry points for another in a language arts lesson. Through her ongoing observations and analysis, or pattern-finding, Terri came up with teaching and learning strategies that connected with these students’ specific music and spatial abilities.

Working with students one or two at a time, Betsy Cornwell was able to observe what strategies were working or not with her students and change them according. In one lesson, Betsy was able to offer a more hands-on, bodily kinesthetic and spatial approach to subtraction for one student, using beans and plates; while the other found it easier to use the traditional paper and pencil method. Meg Costanzo used students’ own reflections and self-described strengths to work with them in constructing appropriate ways for each student to learn the material at hand. For example, Meg helped one student, a carpenter, rally his spatial skills to set up and solve math problems visually/spatially.

**Bridging Myths and Misconceptions**

MI theory is often confused with learning styles. MI theory suggests that we respond, individually, in different ways, to different kinds of content, such as music or language or other people. This is very different from the notion of a learning style. Learning styles refer to different ways of receiving information in terms of sensory modalities (i.e., auditory, visual, or tactile) and social contexts (i.e., extrovert, introvert, field sensitive or field independent.) Learning styles refer to global preferences in how we take in information. In other words, individuals are described as being “auditory” learners or “visual learners” regardless of the task at hand.

Gardner (1999) points out that there is little evidence to suggest that a person who uses or prefers one style in one context will use the same style in another or all other contexts or contents. The link between MI theory and learning styles needs to be worked out empirically, on a style-by-style basis. Consider the example of an individual who has difficulty learning from the spoken word. Meetings, conferences, and classrooms where lecture is primary all present a challenge to her learning. However, if music or sound effects are the auditory content, this individual is a quick study. In this case it would be inaccurate to label this person globally as an “auditory” learner.

In summary, MI theory is distinct from learning styles in at least two major ways: 1) MI theory refers to the ways we respond to and process different kinds of content while
learning styles refer to modes of receiving information; 2) learning styles are used as global descriptors while MI theory varies with the domain or content in question.

**Entry Points and Exit Points**

MI theory’s most distinguishing characteristic, that intelligence is pluralistic, suggests creating for students a context for a broad range of experiences –in domains and across intelligences. MI theory also serves as a framework to organize and develop those diverse learning experiences, commonly referred to as “entry points” or “exit points.” By entry points, we mean how students engage in the subject or content, in other words the activities in which they participate. Exit points refers to what they do to demonstrate their learning, in other words, how students’ learning is assessed. Building MI-based entry and exit points is a common starting point for many teachers new to MI theory.

MI theory becomes a lens onto teachers’ classroom offerings, through which teachers identify strengths and gaps. Giving students a number of choices based on MI theory is widely used by teachers as a vehicle to provide different entry and exit points for students. For example, Martha Jean gave her students different learning options related to specific GED-related content.

**Entry and exit points myths and misconceptions**

A popular myth has developed which goes something like this, “If there are eight different intelligences, then I need to teach everything at least eight different ways.” The question becomes: “How do I fit all the intelligences into this lesson?” rather than “How can I use MI theory to help my students learn about or how to “….”” Every lesson becomes a round robin of MI activities.

Intelligences should not be the goal of the lesson but the means to the learning goals. Trying to do everything eight different ways puts getting all the intelligences “in” at the top of the priority list to the detriment of learning goals. Second, intelligences work in combination, within a domain –a math lesson or project requires, but is not limited to, logical-mathematical intelligence. Dividing all lessons up into eight intelligence-based experiences is inauthentic to how intelligence really works. In contrast to the notion of teaching everything eight different ways, the objective can best be described as finding ways that authentically engage a range of intelligences over time, towards fulfilling existing learning goals.

**Projects**

Multiple intelligences describe the "tools" we bring to any task. Intelligence is couched in what people can do and make, in the problems they solve. Therefore, in many MI classrooms, MI theory has been translated into the implementation of authentic curricula, such as problem-based curriculum and projects that at the very least simulate real world activities. The assumption is that students will engage and learn more successfully if provided with opportunities to solve real problems and make real things. Teachers have found that providing authentic learning opportunities also gives them a chance to see students in new contexts and perhaps to observe student strengths that have as of yet remained untapped.
Meg Costanzo had students participate in a real recruitment project at the Tutorial Center, each taking on one or more tasks to increase student enrollment at the center (which they did). In her role as guidance counselor, Jean Mantzaris had students bring in their childhood games and activities as the basis for a reflection activity. Terri Coustan identified projects in which her students expressed interest, including indoor and outdoor gardening.

What these approaches to MI application have in common is that they are rooted in an understanding of MI theory, its major features, its implications for teaching and learning, as well as a desire to know and use students' intelligences. It is important to note that none of these approaches are mutually exclusive. In fact, all the AMI teachers tried different interpretations of MI theory consecutively or in tandem.

Terri Coustan observed students over time (MI Reflections), instituted student options that gave students different entry points into the lessons (Entry Point), and offered student-centered projects such as gardening (Projects). Over time and through their explorations, AMI teachers settled on MI applications that responded to their needs and goals, worked well in practice, and received positive responses from students.

MI theory did not direct the AMI teachers to any particular teaching techniques, but it served as a catalyst in their MI journeys. MI theory offers a framework and a language to develop practices that best fit one's context while acknowledging, celebrating, and building on the abilities adult students bring to their learning.
REFERENCES


