Truly No Child Left Behind: Implementing the Theories of Melvin Levine and Howard Gardner

Lauri Leeper and Ginny Tonneson

How do we best teach our children? For over a century, theorists have posited a myriad of ideas about intelligence and learning, but there are no definitive answers to this age old question. Though the debate about intelligence is ongoing, the commonly held belief is that humans have a broad overall general intelligence, known as "g," which impacts how we think and learn. While many cognitive psychologists believe there may be linguistic and mathematical parts of intelligence, they continue to view intelligence as a hierarchy with these subcomponents under an overriding "g" (Willingham, 2004). The idea of an overarching intelligence is at the foundation of how we believe students learn, how we educate them, and how we test them. Students are viewed as having a general intelligence somewhere along a continuum. If they score low on an IQ test, they are challenged; if they score high on the test, they may be gifted. To assess how students are progressing in school, we have standardized tests. We don't want any child left behind, so we spend thousands of hours and millions of dollars attempting to get them up to speed--all the while measuring their progress via pencil and paper tests aimed mostly at assessing linguistic and logical abilities. All this makes some semblance of sense only *if* we believe that children think alike, learn alike, and should be assessed alike.

Melvin Levine and Howard Gardner, however, believe there is an alternate, richer way to conceptualize intelligence. They discount the explanatory power of "g" and have come up with a broader, more encompassing way to view human intelligence. They understand that all children are different and no single method of teaching will be effective for everyone. Because their ideas translate easily into a classroom setting, they have gained a significant following among educators. This paper will examine why Levine and Gardner believe

children: 1) think in different ways, 2) learn in different ways, and 3) why schools benefit when they implement their theories. Through this discussion, we will show why it is in the best interest of schools to put Levine's and Gardner's ideas into practice.

Different Ways of Thinking

Both Mel Levine and Howard Gardner believe there is much more to human intelligence than just the vague notion of "g." According to Gardner, "we do not really understand what is measured by 'g'-- it could be anything from sheer intellect to motivation to skill in following instructions to the ability to shift facilely from one kind of problem to another" (Gardner, 2004b, The Theory section, ¶ 8). Both theorists view intelligence as a series of separate, yet interactive, components working together in complex ways. Though Levine and Gardner have differing theories on how intelligence is "organized," both agree that children have different ways of thinking. These need to be identified so that children can maximize their potential. By focusing on strengths and building on weaknesses children become fully realized adults capable of contributing much to society-- emotionally, socially, and intellectually.

Levine's Theory

Mel Levine, a Harvard trained pediatrician, noticed early on in his practice that the available research about children and learning was insufficient in helping him to diagnose children he was seeing for medical evaluations because of difficulties in school. He became intrigued. How children learn became his lifelong passion and area of study, but study from the applied rather than the pure side of science. He developed a theory based upon eight neurodevelopmental systems (Levine, 2002). Levine believes that although each of these

systems is independent, each must interact with others for learning to occur. The eight systems include: attention control system, memory system, language system, spatial ordering system, sequential ordering system, motor system, higher thinking system, and social thinking system. Each is capable of growing, stagnating or deteriorating depending on its usage. Within each of these systems, many other subsets are found that affect very specific areas of learning.

Levine (2005) believes that "in recent decades, many clinicians have oversimplified human differences. . . .far too often invoking a label like ADHD which prevents people from taking a more profound look inside a kid" (p. 71). Once identified, a prescription for the disability is put in place in the form of an individualized education plan (IEP) or 504 plan (Section 504 of the *Rehabilitation Act of 1973*). Thus, educators need look no further, as the diagnosis has been made. Follow-on practices that might, in fact, facilitate learning are not attempted as they are deemed unnecessary. The child has now been labeled. Levine believes strongly in the notion of "splitting rather than lumping," the term he uses for labeling (Levine, 2002). He is much more interested in looking deeply at a child and seeing the differences rather than finding a group in which the child can be lumped.

Identifying differences in children's thinking will go a long way in helping to create successful adults. With this in mind, in 1995, Levine and Charles Schwab created a nonprofit institute, *All Kinds of Minds,* to study thinking and learning differences in children. The mission is to "help students who struggle with learning, measurably improve their success in school and life by providing programs that integrate educational, scientific, and clinical expertise" (All Kinds of Minds, 2007, p. 1). Levine seeks to enhance a child's learning by uncovering these differences and then teaching children what they are and how to use them to their benefit. Short, Kauffman, and Kahn (2000) say "in our lives outside school, we naturally move continuously between visual image, music, movement, mathematics, drama, and language as ways of thinking about our world" (p. 60). These

differences should be explored, exploited, and fostered inside schools as well.

As an outgrowth of Levine's philosophy and decades of individual theory application, Levine's theoretical framework for understanding learning was applied to and used in the creation of a program called Schools Attuned. Its mission is to train teachers to apply this neurodevelopmental knowledge to benefit students struggling in schools. Over 5,000 educators from across the country have been trained under the Schools Attuned program.

Levine has been recording his observations of students for three decades and has thousands of these case studies and anecdotal records to inform his work. A critic of Levine's work, Willingham (2005) asserts, "clinical case studies are always dangerous sources of evidence because there is a tendency to 'see' in these cases what one's theory leads one to expect" (p. 68). Levine (2002) counters this assertion with the argument that each of these individual studies has shed light on learning differences and allowed him to increase his knowledge base and extend his theory for the express purpose of helping children to learn more effectively. Without these cases as foundational work, All Kinds of Minds would not exist.

Gardner's Theory

Howard Gardner, also a Harvard graduate, originally agreed that the center of cognition was logical-mathematical thought, but through his studies with Geschwind, considered by some to be the father of modern behavioral neurology, his ideas began to evolve. He eventually reevaluated the whole notion of "intelligence," redefining it as "a psychological potential to process information so as to solve problems or to fashion products that are valued in at least one cultural context" (Gardner, 2004a, p. 3). Gardner based this new definition on evidence from neurology (looking at which brain regions mediate certain skills), anthropology (examining how different abilities are developed and valued in different cultures across history), and special populations (observing savants, stroke victims, prodigies, and learning disabled individuals).

With this as a backdrop, Gardner (1983) came up with his Multiple Intelligences (MI) Theory. He specified

certain criteria cognitive abilities must meet in order to be considered an "intelligence." A true intelligence:

- has its function located in a specific part of the brain;

- has highly developed examples seen in rare instances;

- has its own set of identifiable practices and procedures;

- has identifiable stages of growth with people achieving the mastery level;

- can trace its development through the evolution of homo sapiens;

- can be identified by specific tasks that can be measured and observed;

- can be quantified *if* psychometric tests are designed to measure unique intelligences; and

- has unique images that are important in completing its identifiable tasks (McKenzie, n.d.).

Using these criteria, Gardner identified seven intelligences: logical-mathematical, linguistic, interpersonal, intrapersonal, musical, spatial, and bodily-kinesthetic. He later added an eighth intelligence--naturalistic. Gardner (2005) also believes there may be enough evidence for an "existential" intelligence, but is not quite ready to call it the ninth. He freely admits that there may be more intelligences and that those already identified have sub-groupings beneath them.

 Gardner points out that the development of one capability does not predict the development of other types of mental representations and that development of these capabilities continues beyond the adolescent years. He believes the extent to which an individual can develop and strengthen an intelligence depends on several things including genetics, motivation of the individual, the quality of instruction, and the emphasis a culture puts on the activity, thus an individual should be able to strengthen their various intelligences if they have the right motivation, training, and tools (Gardner, 2004b). If properly engaged, children will be able to use their strengths while strengthening their weaknesses.

Although Gardner makes a case that individuals think differently from one another by using their various intelligences, the actual empirical evidence to support the existence of multiple intelligences is lacking. Like Levine, much of Gardner's evidence is anecdotal. Waterhouse (2006) points out that there are not any published studies with evidence to support the validity of multiple intelligences. He further explains that most cognitive psychology, neuroscience, and evolutionary research is now focused on studying adapted cognition modules, general intelligence, and multiple information processing systems, none of which support MI Theory. White (2006) points out that Gardner's definition of intelligence, specifically the idea of whether an ability is culturally important, is value-laden. In addition, he questions Gardner's eight criteria for determining an intelligence claiming that they are not empirically founded. Gardner admits that subjective judgment is involved (Smith, 2002), and points out that he has never claimed that his theory is the only description of cognitive capabilities. He simply thinks it provides a better way of understanding the wide variety and scope of human cognition. He also points out that MI Theory is "repeatedly assessed and reformulated as new empirical findings from a variety of disciplines are analyzed and integrated" (Gardner & Moran, 2006, p. 230).

Different Ways of Learning

 Levine and Gardner also assert that children learn differently from one another. Educators typically plan the same lesson for all students, occasionally addressing different learning styles, but without a real thought to the fact that student's brains may actually be processing the information in different ways. Assessments are typically pencil and paper affairs, an unfortunate situation for those students who are not particularly gifted in linguistic or logical thought, or those who have motor difficulties. Both Levine and Gardner believe that educators must identify and address learning differences for optimal learning to occur.

Levine's View

Basing his evidence on years of clinical research, Levine (2002) posits that learning differences occur when elements within each of the eight neurodevelopmental systems are not working at optimum performance levels. When these systems are not working in tandem, as they need to be for optimal development, the result is substandard performance. Levine believes that current measures to evaluate student performance and identify a "disability" are inadequate because they fail to accurately measure a child's true deficits, or for that matter, all of his strengths (Levine, 2002). Presently, schools rely heavily on intelligence and other limited tests to define and label a learning disability. Most dysfunctions "are not uncovered through traditional diagnostic or achievement tests" (Levine, 2008, p. 15). Levine argues, "Since nobody completely understands all parts of the brain and their connections, nobody completely understands all the possible disorders that can cause kids to have a very hard time at school" (1990, p. 11). Even with these limitations in knowledge, however, Levine believes that using his theory of learning as related to the eight neurodevelopmental systems helps teachers, students, parents, and other professionals to understand individualized learning differences among students and to then formulate learning profiles to meet the needs of each child having difficulties in school be they academic or social. When an evaluation that uncovers differences from the eight subsystems is completed and an individualized learning plan implemented, Levine has seen much positive growth from students through his many years of practice. He calls this evaluation, Management by Profile, a "logical and systematic approach to the educational care of kids" (Levine, 2002, p. 277). This individualized comprehensive plan is focused on very specific ways to increase learning in each student, again, splitting rather than lumping (Levine, 2002).

According to Levine (2005), the notion of well-roundedness only applies to childhood. This is a time when it is unacceptable for children to focus on an area of strength at the exclusion of weak areas. When some show evidence of "highly specialized minds," they are viewed negatively rather than positively. Levine is a proponent of focusing on strengths and realizing that students have areas that should be reinforced and nurtured as those will most probably be areas of success in adulthood. Only in childhood has it become the norm and expectation that children need to be strong in all areas. In adulthood it is perfectly acceptable, and even expected, to gravitate toward occupations and activities that exploit strengths and to disassociate from areas of weakness.

Gardner's View

Gardner, too, believes that because children think differently, they also learn in different ways. He subscribes to a constructivist classroom where students try out new ideas to find out what works and what doesn't (Scherer, 1999). Differentiation, a "best practice" in education and a natural outgrowth of MI Theory, provides many opportunities for students to build their knowledge. Does this mean that teachers need to engage all eight intelligences every time they teach? Of course not. MI Theory can be put to use in the classroom in a variety of realistic ways such as creating interdisciplinary units, incorporating student projects geared toward an individual's strengths and interests, creating assessments of types other than standard paper and pencil, and creating apprenticeship opportunities for students (Campbell, 1997). Gardner (1999b) points out that the multiple intelligences also provide useful entry points for a topic and they "offer the opportunity to draw comparisons or analogies from many different domains and to capture the key ideas of a topic in a number of different symbol systems . . ." (Scherer, 1999, p. 14). By using the multiple intelligences as a way to initially engage a student, he or she will be able to learn in a way that is more relevant to them personally. In addition, Gardner is a firm believer in a "deep" as opposed to a "broad" education (Scherer, 1999). MI Theory allows students to learn in deeper ways that are more in tune with how students think, so they will better be able to understand the causes, processes, consequences, and application of the lessons learned.

Students should also be offered a choice in a variety of methods to demonstrate their "ways of knowing;" however, coming up with fair

assessments that truly allow the students to demonstrate their mastery in a variety of ways is a challenging prospect. Trying to incorporate the idea of multiple intelligence testing into our current *No Child Left Behind* (NCLB) (2001) standards-driven educational system is even more daunting.

Not only is multiple intelligence assessment difficult to address within the context of NCLB, but it is probably the most contentious issue with MI Theory as a whole. While we can tell that students learn via different methods, to actually *prove* they have different intelligences is particularly difficult because standard paper and pencil tests measure linguistic and logical thinking, rather than the other intelligences. In order to measure them, Gardner believes that such tests would have to be "intelligence-fair." In other words, they would need to "represent the different modes of thinking and performance that distinguish each intelligence" (Gardner & Hatch, 1989, p. 6). But even these types of assessments may prove difficult in that many activities typically associated with one intelligence type may involve two or more. For example, attempting to assess an individual's spatial intelligence by looking at a sculpture he created might not be accurate because bodily-kinesthetic intelligence came into play when the sculptor used his coordinated hands to create the sculpture. In fact, Gardner says that "until we can actually designate neural circuitry as representing one or another intelligence 'in action,' we cannot know for sure which intelligence or intelligences are actually being invoked on a specific occasion" (Gardner, 2004b, Terminology section, ¶ 5).

Benefits to Schools

Levine and Gardner have theorized a significantly different way of viewing human intelligence and have pointed out the different ways in which students think and learn. Year after year, schools have shown that traditional ways of teaching have been unsuccessful with many children. It is a narrow view focused solely, and today more than ever before, on academic achievement through standardized testing. Because of this, various schools and districts across the United States have chosen to implement these

theories even though they have not met the NCLB (2001) "gold standard" of empirical evidence-based research. What benefits have they found?

Implementation of Levine's Theory

According to All Kinds of Minds (2007), when schools implement Levine's theory they are likely to achieve larger academic growth in their student populations and students are more motivated and engaged. Three empirical studies commissioned by All Kinds of Minds were constructed to meet all six criteria stipulated by the federal government as scientifically-based research. In each study, a combination of both qualitative and quantitative methods was used in phased areas of inquiry. Two of the three studies showed a positive impact on teachers in the areas of expertise regarding learning differences and understanding students' strengths and weaknesses, however, none of the results was statistically significant. Statistical significance was shown in one study in teachers' abilities to apply actionable strategies to manage differences in learning. Under the heading of "impact on students," the most notable areas showing a positive impact of the Schools Attuned program were in increased self-esteem and self-confidence, more self-awareness, motivation and engagement during learning, and positive behaviors. In the area of academic improvements, one study showed a slight increase in select academic improvements. The "impact on educational systems" topic showed greatest gains in new perspectives on learning differences, and a statistically significant higher rating in positive home-school collaboration. This is encouraging as researchers have shown how important home-school collaboration is to student success (Jeynes, 2007). Two of the studies went on to highlight the importance of buy-in to the Schools Attuned program on the part of administrators and the need for creating a community of learners as being key to the success in larger systems. The results look promising. This is only the beginning of much further empirical research. From these studies and recommendations from the researchers, All Kinds of Minds (2007) has concluded that further research is needed using instruments developed specifically to test these nine areas in greater depth. This organization is in the process of

commissioning development of such instruments with the express purpose of implementing future empirical studies to increase the evidence showing positive outcomes of Schools Attuned.

Implementation of Gardner's Theory

In a similar vein, many schools have taken the basic ideas of MI Theory and successfully implemented them. There is no overall organization to guide putting the theory into practice (Kornhaber, 2004), but Gardner, in fact, has encouraged schools to experiment with it. Teachers have been able to pick and choose what works well for them, and with the increasingly varied options technology provides, teachers are finding additional ways to differentiate instruction to address the multiple intelligences. Willard-Holt and Holt (1997) found that using MI in schools stimulates students' intelligence by encouraging differentiation of the *process* of learning using higher order thinking skills as well as differentiating the *product* by expressing learning in personal ways. Maker, Nielson, and Rogers (1994) also found that MI encourages students to bring their own culture and experiences into the curriculum and to connect and learn from the community. Similarly, schools which successfully use MI Theory are more likely to have an awareness of the different ways students learn, a culture that supports diverse learners and hard work, collaboration among and outside the staff, choice with a meaningful curriculum and assessment options, and incorporation of the arts across the curriculum (Gardner, 1999a). While MI Theory can be put to use in the classroom in a variety of ways, Gardner (2004a) believes it is best used as a tool, rather than as an educational goal in and of itself. For example, the teacher who uses various intelligences as a strategy to introduce the Civil War is using it logically, whereas, the teacher who has a goal of coming up with eight different ways of practicing every single lesson is missing Gardner's intent

Since there are so many other variables that come into play within a classroom, it is very difficult to substantiate that schools which use MI Theory have success *because* of it; however, anecdotal evidence points to the benefits of its implementation. For example, in 1992, Harvard's Project Zero conducted an initial study of 11 schools that used MI Theory (Krechevsky & Kornhaver, n.d.). Despite the fact that these schools had no formal training or oversight, the principals of these schools found it encouraged teacher collaboration, it provided a useful terminology for teachers to discuss curriculum and student strengths, and it encouraged teachers to create unique learning environments for their diverse student populations. Harvard also sponsored the Schools Using Multiple Intelligences Theory (SUMIT) project which researched 41 schools that had been using MI Theory for at least three years. They found that 80% of the schools showed an increase in parental involvement, 78% of the schools showed increased standardized test scores, and 81% reported an improvement in discipline. In all three areas, between 63% and 75% of these schools attributed the improvement to the use of MI Theory (Gardner, 2004b). Detractors of the SUMIT findings are quick to point out that there was no control group and there is no way of knowing whether the increase in scores was due to using MI Theory or whether it was merely because of the excitement of participating in something novel (Willingham, 2004). Gardner, himself, admits that "absent of the kind of controlled studies that are almost impossible to mount outside of medical settings, it is simply not possible to prove that it was MI that did the trick" (Gardner, 2004b, Educational Issues section, ¶ 4). Despite this lack of definitive proof, however, teachers continue to see the benefit of using his ideas.

Conclusion

Overall, Levine and Gardner offer two intriguing models for conceptualizing human cognition. Both agree that students have different ways of thinking and different ways of learning. Neither theory has been empirically proven, and yet decades of case study research and anecdotal evidence from schools where their theories have been implemented shows that they can be very effective. A program that shows promise in increasing students' self-esteem, self-awareness, self-confidence, motivation, engagement, and positive behaviors should be seriously considered for implementation. A program that strengthens teachers' abilities to identify

learning differences, devise individual learning profiles, and apply actionable strategies to manage different "ways of knowing" is one needed in today's schools. All of these positive outcomes for both students and teachers deserve consideration rather than repudiation.

Some would argue that NCLB provides strict guidance to use only empirically proven research in the classroom and to do otherwise would be considered educational malpractice (M. Tschannen-Moran, personal communication, February 19, 2008). A theory that provides a teacher with the tools, vocabulary, and creativity to approach individual students in a manner that really hones in on the way in which they think and process information, is one that should be implemented. Students are not automatons. They don't think alike, nor do they learn alike. Each arrives at school with unique strengths and weaknesses. Teachers assess those areas regularly and are expected to take a student from where he or she is and differentiate instruction to exploit their talents and build their weaker areas. Both Levine and Gardner offer a format for differentiated instruction that allows teachers to both build on students' strengths and strengthen students' weaknesses. We can no longer sit idly by and hope that today's education system will fix itself. Children are being left behind every day. It is in our schools' best interests to implement these theories. If we *don't* use the best practices from Levine and Gardner, we really are guilty of educational malpractice.

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