

M

MAINSTREAMING

Hallahan & Kauffman (2000) defined mainstreaming as “the placement of students with disabilities in general education classes for all or part of the day and for all or only a few classes” (p. 66). Students with disabilities may be assigned to a continuum of educational placements from general education classroom, on one end of a continuum, to institutionalization on the other. A student’s placement within this continuum is determined by his or her Individualized Education Plan (IEP) committee. Several factors contributed to the mainstreaming movement such as normalization, deinstitutionalization, early intervention and early childhood programs, technology advances, and legislative actions such as the 1990 Individuals With Disabilities Education Act (IDEA) (previously known as the Education for all Handicapped Children Act [1974]). Developments in the past decade have moved the discussion of mainstreaming toward inclusive education, whose advocates propose that all students’ educational needs can be met in general education classrooms.

—Wade R. Arnold

See also Inclusive Education; Special Education

REFERENCES AND FURTHER READING

Hallahan, D. P., & Kauffman, J. M. (2000). *Exceptional learners: Introduction to special education* (8th ed.). Needham Heights, MA: Allyn & Bacon.

MANIFESTATION DETERMINATION

When a student with a special education disability violates school discipline policy that ordinarily would result in suspension or expulsion, manifestation determination is completed to ascertain whether the behavior that violated school discipline policy was a result of the student’s disability. Manifestation determination also assesses the educational placement and program (called the Individualized Education Plan [IEP]) of the student to determine whether the program was adequately meeting his or her educational needs. If the misbehavior is deemed to be a result of the student’s disability or if the district does not have positive behavior support interventions in place for the student, then the school’s discipline policies may not be applied to the special education student.

Manifestation determination was mandated under the Individuals With Disabilities Act 1997 (IDEA 1997) to clarify procedures under which school personnel could suspend a special education student from school or apply the existing school discipline policies to the student’s problem behavior. Schools are charged with developing prevention programs to reduce or eliminate future occurrences of behavior problems. In this vein, schools should develop clear expectations or rules for students’ behavior, and the consequences for misbehavior, and inform parents and students of these expectations and potential consequences.

GENERAL PROCEDURES

Disciplinary actions taken by schools for any behavior problem may result in in-school disciplinary actions or out-of-school disciplinary actions. For students with disabilities, any in-school disciplinary action may be used as long as it does not violate the student's IEP. IDEA 1997 requires schools to treat special education students that are suspended or expelled from school differently than the rest of the student body. The removal of a student with a disability from school for disciplinary reasons constitutes a "change of placement" if the absence from school is more than 10 cumulative or consecutive days (during a school year), and the suspension(s) constitute a "pattern of removal." *Pattern of removal* is vaguely defined but generally refers to the length of time a student is removed, the proximity of the removals to one another, or the length of each removal. The student's special education teacher is charged with determining if a *change of placement* has occurred by examining the pattern of removal. If a pattern of removal has occurred and after the 10th day of suspension, the parents must be notified that a placement change has occurred. If the parents or guardians disagree with the assessment results, findings, recommendations, or placements resulting from the manifestation determination process, they may invoke their right to a due-process hearing with an impartial hearing examiner.

DATA COLLECTION PROCEDURES

After the parents have been notified, the IEP team has 10 business days to collect data for the manifestation determination. The IEP team decides on the types of information needed to determine if the behavior(s) in question is not a manifestation of the student's disability. The types of information collected must include a current functional behavior assessment (FBA), a review of school records, any previous psychoeducational evaluation or diagnostic reports, the child's current IEP and placement, and, when possible, an observation of the child. Interviews will frequently be conducted with the child, the child's teacher, and the parents. Using the above-mentioned information, the IEP team must determine whether:

- The IEP and placement were appropriate.
- Positive behavior intervention strategies were employed.

- The child's disability did not impair his or her understanding of the consequences of the misbehavior.
- The child's disability did not impair his or her ability to control the behavior subject to disciplinary action.

If the child's IEP or educational placement was not considered to adequately meet the student's needs, then the team must conclude that the behavior was a manifestation of the student's disability. In this scenario, the child cannot be subject to long-term removal from school, and the district must take immediate action to remedy the deficiencies in the placement or IEP. Based on the available data, the IEP team may recommend a change of placement; however, parental consent is required. A 45-day interim placement may be used if the misbehavior involved weapons or drugs. If the child's behavior was not considered to be a manifestation of his or her disability, then the district may proceed with the existing suspension or expulsion policies.

**PERSPECTIVES ON
MANIFESTATION DETERMINATION**

The manifestation process is similar to the well-known legal precedent of determining if a person should be held responsible for his or her criminal behavior because of a preexisting mental condition. The criminal behavior of persons with mental conditions that preclude their ability to judge right from wrong frequently lead to mental health treatment rather than harsher prison sentences. This view features a medical model orientation that states that the problem or disorder is within the person and is not influenced by the environment and is therefore "context independent." This view is not currently accepted by contemporary psychologists as nearly all mental disorders are viewed as *context dependent*, or are significantly influenced by environmental conditions.

Katsiyannis and Maag (2001) argue that disability categories are socially constructed rather than medically validated. Socially constructed disability categories are subject to social and political pressures within the school and in society. As a result, it is extremely difficult to develop scientifically validated assessment and treatment approaches for students with similar educational disabilities. These problems

magnify the dilemma of stating with certainty that the student's behavior was caused by the disability.

Katsiyannis and Maag (2001) proposed an alternative skills assessment model to improve the manifestation determination process. In this approach, the goals of assessment are to ascertain whether the student possesses the skills required to engage in appropriate behavior, analyze problem situations and interpret them, and enable the student to self-monitor his or her own behavior. Student and teacher interviews, self-report scales, and social role-plays would be employed to gather information on the above-mentioned questions. With a greater use of instruments and approaches for directly observing the behavior of the student in question, this approach has greater scientific credibility and holds promise for improving the manifestation determination process.

—Steven W. Lee

See also Diagnosis and Labeling; Discipline; Expulsion; Functional Behavior Assessment; Individuals With Disabilities Education Act; Special Education; Suspension; Violence in Schools

REFERENCES AND FURTHER READING

Katsiyannis, A., & Maag, J. W. (2001). Manifestation determination as a golden fleece. *Exceptional Children*, 68, 85–96.

MASTERY LEARNING

Mastery learning is “both a philosophy of instruction and a set of methods for teaching and assessing” (Gentile & Lalley, 2003, p.172). As a philosophy, it endorses the belief that, except for the most severely cognitively impaired, all children can learn what the schools are accountable for teaching. As a set of teaching and testing methods, it requires that each student be assessed in a criterion-referenced manner—that is, without reference to the performance of others—on how well he or she is achieving the required instructional objectives.

The belief that all children can learn was a central tenet of Benjamin Bloom's initial formulation of mastery learning in 1968. He deduced this from John Carroll's 1963 model of school learning, in which Carroll rejected the traditional norm-referenced view of aptitude as an intellectual trait of cognitive

complexity or capacity in favor of a criterion-referenced measure of time needed to learn to a preestablished standard. Individual differences still existed, but they would be measured by rate of achieving mastery for a given domain of instructional objectives (e.g., in math vs. history vs. music).

Bloom championed this notion, suggesting that by using criterion-referenced techniques to hold students accountable for achieving important instructional objectives, and by requiring that students remediate and retest, they would all eventually attain mastery. Bloom's methods, called Learning for Mastery, allowed traditional group-based instruction, with individualization occurring as needed depending upon the results of mastery testing. Another system, derived independently from a behavioral contingency management approach by Fred S. Keller (1968), required a totally individualized approach to instruction. Keller's Personalized System of Instruction was more popular in higher education settings than in public schools.

Both systems have the following common features, which serve to define mastery learning (e.g., Block & colleagues, 1989; Gentile & Lalley, 2003):

1. Clearly stated mastery objectives, published for all and sequenced to facilitate transfer of previous knowledge and skills to current and future lessons
2. A preestablished passing standard that is sufficient to guarantee adequate original learning (e.g., 75% correct or more)
3. Criterion-referenced grading, with correctives and retesting required to demonstrate attainment of those objectives
4. Grading incentives to encourage students to go beyond initial mastery and strive for fluency in the material, to better organize, apply, and even teach it

The most common failings in implementing mastery learning occur when mastery is conceived as the endpoint of learning. Mastery, rather, implies only that initial learning of knowledge or skills is sufficient so that when it is forgotten, as it inevitably will be, it can be relearned quickly. With sufficient practice beyond original learning, called overlearning, the material or skill can become automatized, relatively permanent in memory, and sufficiently fluent to be

available for transfer. Thus, a mastery learning scheme must award the lowest passing grade for initial acquisition of the required objectives (even if the score on the test is 100% correct) and reserve higher grades for students who complete projects or otherwise demonstrate applications or higher-level analyses of the course content or skills.

—J. Ronald Gentile

See also Classroom Climate; Criterion-Referenced Assessment; Learning; Norm-Referenced Assessment

REFERENCES AND FURTHER READING

- Block, J. H., Eftim, H. E., & Burns, R. G. (1989). *Building effective mastery learning schools*. New York: Longman.
- Bloom, B. S. (1968). *Mastery learning. UCLA-CSEIP evaluation comment. 1(2)*. Los Angeles: University of California at Los Angeles. Reprinted in J. H. Block (Ed.). (1971). *Loves through time*. Berkeley, CA: Bancroft Books.
- Block, J. H. (1971). *Mastery learning: Theory and practice* (pp. 47–63). New York: Holt, Rinehart & Winston.
- Carroll, J. B. (1963). A model of school learning. *Teachers College Record, 64*, 723–733.
- Gentile, J. R., & Lalley, J. P. (2003). *Standards and mastery learning: Aligning teaching and assessment so all children can learn*. Thousand Oaks, CA: Corwin.
- Keller, F. S. (1968). Goodbye teacher. *Journal of Applied Behavior Analysis, 1*, 79–89.

MATHEMATICS CURRICULUM AND INSTRUCTION

The mathematics curriculum in K–12 schools is organized across four major areas, number systems, algebra, geometry and measurement, and statistics and probability. While emphasis varies, each grade level's curriculum will likely include experiences with topics in each area. During their study of mathematics, students are expected to learn concepts and procedures, and both are required for mathematical expertise.

The study of numbers begins early with whole numbers and the process of counting. As students age, the number systems they study increase to include integers, rational numbers, and real numbers. Students learn to represent numbers in a variety of ways. For example, the number 5 may be represented by 5 beans, as the difference between 12 and 7, as a product of

20 and $\frac{1}{4}$, and as the square root of 25. Students learn to write numbers as fractions, decimals, and percents and to complete computation problems with numbers written in various forms. Understanding that numbers can be represented in many different ways is key to developing common sense about numbers and being able to use them in various real-world settings.

The study of algebra begins with a study of patterns by young children. Some patterns involve counting; others involve computational relationships. Older students begin to write patterns using variables and then use variables as unknowns in equations and inequalities and when solving problems. Students learn to represent functions using a table of values, an equation, and a graph. The ability to describe patterns in different ways and to use a variety of different representations is key to developing algebraic thinking.

The study of geometry and measurement includes shapes, their properties and relationships. Students begin exploring common two- and three-dimensional shapes. As they study more complex shapes, they also analyze shapes for their properties, noting such characteristics as number of sides, sum of angle measures, and sides or angles of equal measure. Students learn that some shapes are congruent and some are similar. They also learn how sets of shapes are related, such as all squares are parallelograms. Students study perimeter, area, and volume and their use in the real world.

The study of statistics and probability centers on ways to display and analyze data. Young students create bar graphs of information about themselves and their surroundings. Older students learn other ways to display data and how to select the best representation for a particular set of data. Measures of central tendency (mean, median, and mode) are studied as well as measures of variability, such as the range and standard deviation. Concepts of chance and likelihood provide an introduction to probability; students then learn to calculate the probability of an event occurring and use concepts of probability to analyze information in the real world.

During the study of mathematics, students in all grades develop their problem-solving and reasoning processes. A primary purpose of studying mathematics is developing abilities useful in solving problems that arise in both real-world and mathematical settings. Systematic reasoning is a critical part of mathematics, so students need to engage in the process of making conjectures and developing sound deductive arguments. Problem solving and reasoning should be

an integral part of the study of all content areas in mathematics.

Two different views of learning influence mathematics teachers' instruction. First, the *constructivist view* describes how learning occurs as students construct, enhance, and restructure their own knowledge as a result of their thought processes, direct interaction with their environment, and social interaction with other people. In the constructivist approach, students are encouraged to construct meaning in their own way from their own experiences (Karp & Voltz, 2000). The second approach is based on *behavioral theories*, in which researchers view learning as the direct transfer of knowledge from the teacher to the learner. In direct instruction, the teacher explains and demonstrates, asks questions, and provides practice on the topic to be learned. Students derive knowledge from the information presented by the teacher. While constructivism has shaped the current reform in mathematics education, aspects of many theories may help students learn.

The focus of mathematics instruction is not just rote memorization but learning mathematical concepts and procedures with understanding. Researchers have investigated ways to help all students gain mathematical understanding that include using manipulatives, helping students solve problems, using technology, and writing and reflecting.

USING MANIPULATIVES

Concrete materials, or manipulatives, can be used to represent mathematical concepts. To develop a deep understanding of mathematical ideas, all students need to see and experience an idea in different ways. For example, students beginning to understand the idea of *one-half* need experiences with that concept using different materials, such as one-half of a candy bar, one-half of a group of oranges, and one-half located on a number line. While concrete materials are more common in elementary school, middle and high school algebra and geometry students benefit from using algebra tiles to model factoring and multiplying polynomials, and using models of two- and three-dimensional geometric figures to investigate measures, properties, and relationships.

Some researchers (Fleischner & Manheimer, 1997) recommend a sequence of activities for any topic that begins with the use of concrete materials followed by work with semiconcrete (pictorial) and abstract

representations. For example, students need to see connections among the two-digit number, 11, represented concretely as one set of ten blocks and one more block, a picture of those blocks, and the numeral 11. Individual students will need more or less work with concrete and pictorial representations, but research shows that students with learning difficulties benefit from extended practice with manipulative materials.

SOLVING PROBLEMS

Learning to solve problems is an important part of learning mathematics. In addition to some traditional word problems, students are expected to solve more complex, often real-world-based, problems. However, students find problem solving to be difficult, and students with learning disabilities are even less successful than students without disabilities.

Many teachers and written materials present a version of Polya's (1957) suggestions for solving problems. His four steps are:

1. Understand the problem.
2. Devise a plan.
3. Carry out the plan.
4. Look back.

Research shows that students have particular difficulty making sense of some problems and representing them in mathematical form. Addressing this difficulty, teachers and researchers have enhanced the four steps with specific strategies or extra steps. Frequent suggestions include paraphrasing the problem and identifying important words as specific aspects of understanding the problem and drawing a picture or diagram as a part of devising a plan.

USING TECHNOLOGY

Both calculator and computer technology have changed aspects of teaching and learning mathematics. Calculators can be used to explore, develop, and reinforce numerical concepts of estimation and computation, but teachers must help students learn how and when to use the calculator with recognition of its constraints. Students need to be aware that calculators approximate values that have more digits than the

display can accommodate. For example, a calculator that can display 10 digits would show 0.6666666667 as a value for two-thirds rather than the repeating decimal. Some calculators have built-in capability to simplify numerical expressions using order of operations, while other calculators do not. For example, a calculator with the capability to implement order of operations will correctly determine that $3 + 5 \times 4$ equals 23, but a calculator without order of operations will indicate that $3 + 5 \times 4$ is 8×4 or 32. When students use the calculator for computation, teachers need to ensure that they understand the algorithms upon which the calculations are based.

Middle and high school students use graphing and dynamic geometry tools. Using graphing technology, many students discover mathematical ideas on their own. In particular, students can generate a large set of examples, then make conjectures based on observed similarities or differences. For instance, as students graph several linear functions that pass through the origin but have different values for the slope, students can see the relationship between the size of the slope and the steepness of the line. Dynamic geometry tools on either calculators or computers can be used to make and test conjectures and explore theorems about geometric shapes. Such activities provide students opportunities to explore why rules, properties, and relationships are true.

WRITING AND REFLECTING

Mathematics teachers are using writing to encourage students to reflect on their experiences and to think about their learning. Young students frequently combine their writing with pictures or diagrams to illustrate their ideas. As students age, they should increase their use of correct mathematical language to express their ideas and provide more detailed explanations and reflections. When students communicate their ideas in writing, they learn to clarify, refine, and consolidate their thinking. In the process, students can also discover new ideas and make new connections. One child said, “when you write about math, you get more ideas” (Whitin & Whitin, 2000, p. 4).

Writing has come to be an important part of problem-solving instruction in many mathematics classrooms. Students are writing to communicate their solutions to problems; that is, they are writing a description of the entire problem-solving process that led to an answer. In this type of writing, students are

encouraged to describe the strategies they used and explain why their solution makes sense. Such justification is expected because many problems have various methods of solution and sometimes more than one correct answer.

CONCLUSION

Because all students need to learn mathematics, education professionals are working to provide high-quality materials and methods in all K–12 classrooms. Both curriculum and instruction must play roles in meeting the goal of “high expectations and strong support for all students” (National Council of Teachers of Mathematics, 2000, p. 12).

—A. Susan Gay

See also Mathematics Interventions and Strategies

REFERENCES AND FURTHER READING

- Fleischner, J. E., & Manheimer, M. A. (1997). Math interventions for students with learning disabilities: Myths and realities. *School Psychology Review*, 26, 397–413.
- Karp, K. S., & Voltz, D. L. (2000). Weaving mathematical instructional strategies into inclusive settings. *Intervention in School and Clinic*, 35, 206–215.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: National Council of Teachers of Mathematics.
- Polya, G. (1957). *How to solve it* (2nd ed.). Princeton, NJ: Princeton University Press.
- Whitin, P., & Whitin, D. J. (2000). *Math is language too: Talking and writing in the mathematics classroom*. Urbana, IL: National Council of Teachers of English.

MATHEMATICS INTERVENTIONS AND STRATEGIES

Since the National Council of Teachers of Mathematics released its *Standards* in 1989, reform of mathematics curriculum to increase students’ understanding of mathematical concepts has been a major issue of discussion. Most agree on the goal; however, fierce debates have arisen about the best instructional methods to reach those goals. Some have stressed discussion of problem-solving strategies and the emergence of mathematical discussion between students as the most critical elements in mathematics reform.

Others have feared that by minimizing the teaching of arithmetic computation and simple word problems, many students—especially those with learning disabilities, individuals with psychological processing or learning difficulties, and other learning problems—would never develop conceptual understanding.

In 2001, the National Research Council issued a report on lessons learned from experimental, development, and case-study research on teaching and the learning of mathematics. This document, *Adding It Up*, concluded that mathematical proficiency includes:

- Understanding mathematical concepts
- Fluent and accurate computational ability
- Strategic competence
- Adaptive reasoning

The latter two reflect insights gained from cognitive science and developmental psychology. Strategic competence is the ability to use either words or pictures to represent a problem and potential solutions, and the ability to develop multiple strategies for solving mathematical problems. Adaptive reasoning is the ability to justify strategies, and to analyze strengths and weaknesses of solutions proposed by others. These are ambitious goals, but they should be the objectives of a mathematics intervention.

Between 1996 and 2002, several researchers synthesized the experimental research on effective mathematics interventions for students who struggled with mathematics. Although the body of research is small, and many of the measures only tap one or two of the elements of mathematics proficiency noted previously, the syntheses suggest several features of instructional interventions that are likely to enhance achievement for these students. Some of the more promising interventions feature mediated verbal rehearsal, the use of visual representations, peer-assisted learning, and strategies for the efficient retrieval of basic arithmetic facts. These would seem to be indicators of teaching situations or interventions that are likely to be successful for this group of struggling students.

One technique, sometimes called mediated verbal rehearsal, that seems to be effective is taught in the following sequence:

- Providing examples
- Demonstrating proficient math solutions to students

- Requiring students to solve similar types of problems
- Requiring students to verbalize their justifications for their solutions

This technique appears to work when the teacher gives students feedback about the solution and justification. This approach attempts to build what the National Research Council calls strategic competence and adaptive reasoning in students.

The intervention research also supports the use of visual representations (e.g., figures, drawings, diagrams) of mathematical problems. This would seem to support the idea that students with learning problems are helped when they are required to represent mathematical relationships and problems in multiple ways.

Students with learning problems benefit from peer-assisted instruction. Typically a student who is struggling is paired with a more proficient student. However, both play the role of tutor and tutee. This enables the less proficient student to carefully watch, monitor, and question what and why the peer is solving a problem in a particular fashion. It also allows the more proficient peer to ask the student with a learning problem to articulate why the decision was made, to suggest that the student draw out a picture of the problem or put his or her reasons for a strategy choice into words. Tutors and tutees can be trained in a variety of techniques that promote this type of dialogue about mathematics. There is some evidence that more expert tutors or interventionists can use a similar methodology, especially when students are working on more complex mathematical material.

Some important findings have emerged from the research on the nature of mathematics difficulties and disabilities. A key finding is that students with mathematics difficulties tend to be unable to rapidly retrieve basic arithmetic facts (also known as arithmetic combinations). Proficient students often easily and quickly retrieve these combinations, such as $9 + 8$, or 7×6 . Students with mathematics difficulties often resort to inefficient procedures such as counting on their fingers. When students cannot quickly recall that $9 + 8$ is 17, or 7×6 is 42, they are likely to get lost in more mathematically advanced discussions. We know that efficient retrieval of basic arithmetic combinations/facts is a goal of mathematics interventions. However, we are less certain about what are the best teaching strategies beyond extensive drill on memorization of these combinations. Increasingly, researchers are

arguing for approaches that immerse students in learning these combinations, but also using them as a means to build understanding of mathematical relations and concepts. To date, little research has compared the relative effectiveness of pure drill (often through computer exercises) as an intervention with intensive teaching of the strategies underlying the arithmetic facts. This is a critical area in mathematics intervention research. It is possible that a mixture of both approaches is optimal.

Currently, the findings from the intervention research provide only broad guidelines on how to teach or how to effectively intervene when students experience difficulties in learning mathematics. Research should be useful to school psychologists, however, as a guide to what seems to be effective practice. Assisting with setting up peer tutoring programs or cross-age tutoring programs is likely to be helpful. In addition to implementing or helping teachers to implement interventions that boost the math achievement of students, school psychologists should keep abreast of advances in measures for screening students who require early intervention and work with teachers to set up progress monitoring systems for students who do poorly in mathematics based on state assessments.

—Russell Gersten and Jonathan R. Flojo

See also Academic Achievement; Cooperative Learning; Grades; Homework; Learning; Learning Styles

REFERENCES AND FURTHER READING

- Baker, S., Gersten, R., & Lee, D. (2002). A synthesis of empirical research on teaching mathematics to low-achieving students. *The Elementary School Journal*, 103(1), 51–73.
- Fuchs, D., & Fuchs, L. S. (2001). Principles for the prevention and intervention of mathematics difficulties. *Learning Disabilities Research & Practice*, 16(2), 85–95.
- Geary, D. C. (1993). Mathematical disabilities: Cognitive, neuropsychological, and genetic components. *Psychological Bulletin*, 114, 345–362.
- Hanich, L., Jordan, N., Kaplan, D., & Dick, J. (2001). Performance across different areas of mathematical cognition in children with learning disabilities. *Journal of Educational Psychology*, 93(3), 615–626.
- National Research Council. (2001). *Adding it up: Helping children learn mathematics*. In J. Kilpatrick, J. Swafford, & B. Findell (Eds.), *Mathematics Learning Study Committee*, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

MEDIA AND CHILDREN

Every day children are exposed to the best and worst of our society through media. The media include television, radio, Internet, video games, and other forms of electronic devices. For better or worse, media impacts children's achievement, behavior, and health. Significant mediating factors include parental supervision, amount and type of media, and child characteristics.

The results of a nationwide survey of 3,155 youngsters found that the average American child has access to an impressive array of electronic media—three televisions, three tape players, three radios, two CD players, one video game player, and one computer. They found that children 8 to 18 years of age average nearly 6.75 hours with media every day. Sixty-five percent of these children and adolescents watch TV with their meals and have a TV in their bedrooms, while 61% stated they had no rules about TV in their homes. Only 5% of these youngsters watched TV with their parents. Although 21% have computers, respondents averaged only 21 minutes per day playing computer games. In addition, older teens spend, on average, 87 minutes per day listening to music. Children 2 to 7 years of age average 3.5 hours per day with media and 32% of this group have a TV in their bedrooms.

MEDIA'S IMPACT ON ACHIEVEMENT

Preschool Level

Before kindergarten, parents who select educational TV programs like *Sesame Street* provide their child with a solid advantage. Longitudinal research has found positive outcomes for students watching *Sesame Street*. Using Center for Research on the Influences of Television on Children (CRITC) data, Wright and colleagues (2001) found positive correlations between *Sesame Street* and scores in reading, math, vocabulary, and readiness even when factors like socioeconomic status were statistically controlled. When compared to nonviewers, Huston and colleagues (2001) found that high school students who had watched *Sesame Street* as preschoolers read more books; academically outperformed nonviewers in English, science, and math; and were more highly motivated to achieve. They also found that five-year-old

males who watched *Sesame Street* were less aggressive as teens than those who did not watch.

Committed to children's best interests, the producers of *Sesame Street* use child development principles to teach concepts. Fisch (2002) reviewed educational TV and noted improvements in language skills from shows including *Barney & Friends*, *Between the Lines*, *Blues Clues* and *Electric Company*. Reading comprehension skills showed improvement in students watching *Reading Rainbow* with increases in library usage noted.

In Huston's early learning model, TV's educational programs promote language skills, motivation, and behaviors needed to sustain attention and concentration. As a result, students experience early academic success, which firmly sets the foundation for future success.

Elementary Level

While educational programs are excellent examples of TV's promise, the reality is that TV incessantly promotes itself as entertainment. Cunningham & Stanovich (1998) reported that individuals reading popular magazines had three times more opportunities to learn new vocabulary words than those watching prime-time TV. A three-year Dutch study of second and fourth graders found that TV negatively influenced reading comprehension skills by reducing recreational reading and depreciating reading's value. They also found that reading subtitles on televised programs improved reading.

Studies have shown significant math gains and a better attitude toward math in students who viewed *Infinity Factory* and *Square One TV*. In science, *3-2-1 Contact* and *Bill Nye the Science Guy* enhanced students' scientific knowledge while promoting problem-solving skills and a positive attitude toward science.

Secondary Level

Keith and colleagues (1986) studied the cumulative effect of TV viewing on high school seniors. When high-ability students spent more than one hour per school day watching TV, their academic achievement declined. Students from low socioeconomic status families and low-ability students watched more TV than more economically advantaged and more capable students. Gentile and Walsh (2002) investigated

family media habits and found that a TV in a child's bedroom correlated with lower school performance even when statistically controlling for income and race. Thirty-eight percent of American children have a TV in their bedrooms. African American and Hispanic children are more likely than whites to have a TV in their bedrooms, and children from low-income families are more likely to have a bedroom TV than those from higher-income families.

Gentile and Walsh (2002) also found that:

- Children whose families leave the TV on when no one is watching it perform poorly academically.
- Children with a TV in their bedrooms watch 5.5 hours more TV each week than those who do not.
- Children who participate in alternate activities do better in school than those who do not.

In general, children who watch less TV are monitored more by parents; and their families have more knowledge about media and media effects, use electronic and print media more carefully, and participate in alternate activities rather than using media.

Intellectually bright students watch beneficial TV shows, while low achievers prefer violent programs. Students with disabilities watch more TV than their peers. The emotionally disturbed students watch more crime stories and cartoons and frequently identify with their favorite TV character. Students with learning disabilities may believe that TV reflects reality and have difficulty understanding special effects and TV ads.

MEDIA'S IMPACT ON BEHAVIOR

Historically, the impact of media on aggressive behavior has been a concern since the 1930s. Major investigations have all conclusively determined that televised violence is a contributing factor to aggression in children. Studies have found that TV violence poses a serious risk of harm to children. Parke & Slaby (1983) documented four effects of violent media:

1. The *aggressor effect* increases aggressiveness toward others.
2. The *victim effect* makes the viewer see the world as a mean place, which requires one to protect oneself.

3. The *bystander effect* makes viewers become apathetic and desensitized to the needs of others.
4. The *appetite effect* makes viewers want to seek out more violent material.

In a 15-year longitudinal study, Huesmann and colleagues (2003) investigated the effects of violent media on children 6 to 10 years of age. Statistically controlling for socioeconomic status, intellectual ability, and parenting factors, media violence predicted adult aggressiveness. Men who were high TV-violence viewers as boys were three times more likely to be convicted of crimes than other men in the study. Further, these men were significantly more likely to be aggressive toward their spouses, react to an insult by shoving another person, and to have a moving traffic violation. Women who were high TV-violence viewers as girls were four times more likely to assault another adult than other women. Further, they were more likely to throw something at their spouses, commit a criminal act, and to have a moving traffic violation.

Consuming two to four hours of TV daily, a typical child will see 8,000 murders and more than 100,000 acts of violence by the time he or she leaves elementary school. Researchers conclude that video games prime aggressive ideas, reinforce overlearning of aggressive scripts, and increase perceptions of others as being hostile. Increased time with TV and computerized games along with decreased outdoor play have contributed to the growing problem of childhood obesity. Studies show that when elementary children restrict their TV viewing, significant decreases in body mass index are measured. Not just physical health is affected by media access. Although parents reported positive academic benefits with declines in face-to-face social interactions, lower scores on self-ratings of psychological well-being were observed.

PARENTAL CONTROLS

It is obvious that parents have tremendous responsibility in raising their children. Parents should ask the following questions about a TV program, "Is it developmentally appropriate for their child? Does the program promote their child's emotional development such as trust, the foundation of relationships?" Other questions focused on children's needs to be connected in meaningful relationships, to be empowered with the

belief of making a positive difference in nonviolent ways, to respect diversity, and to act responsibly and morally. In 1998, Cantor reminded parents of the extraordinary precautions most take to safety proof their home for their baby. Over time, television poses just as great a risk to a child's well-being in a myriad of ways, from usurping family rituals like dinnertime to undermining social values. In her research, Cantor documented that media programs can frighten children, create anxiety, and interfere with their sleep.

Practical Solutions

DeGaetano & Bander (1996) provided the following practical tips for parents on supervision the TV habits of their children:

- Establish the contingency of doing some developmentally appropriate physical activity before TV is watched.
- Establish homework as priority over TV.
- Start each school day without TV.
- Set 10 minutes aside for family discussions for each hour of TV watched.
- Use a timer to log time children spend on playing, reading, homework, household chores, and media.
- Hold nightly family reading time.
- Encourage writing.
- Provide developmental activities as alternatives to TV.
- During coviewing, ask questions about the TV shows such as the children's likes and dislikes.
- Treat violent TV and movies as a "hot stove" for their children.

Jason & Hanaway (1997) recommend three ways to reduce TV watching by youngsters. They defined them as low-tech, middle road, and high-tech solutions. *Low tech solutions* de-emphasize the omnipresence of television by:

- Keeping only one TV for family viewing and getting rid of extra TVs
- Keeping TV sets out of the kitchen and bedrooms
- Discussing ways to reduce TV watching
- Setting limits on amount of TV time
- Closing the doors of the entertainment center or simply covering the TV when it is not in use

The *middle road strategy* uses behavior management principles. First, parents and children keep a log of activities and sign a contract for TV rules. Next, children earn tickets to watch TV by first engaging in developmentally appropriate activities. Finally, the *high-tech strategy* uses electronic tools such as Addi Jurs' The Switch, CinTel's Super Vision, and Randal Levenson's TV Allowance. Also, newer TVs are equipped with the V-chip. Kaiser Foundation's report (2001) indicated that only 17% of parents with V-chip TVs used it to block programs with sex and violence. Instead, they relied on the seven TV parental guideline ratings as guides for their children's time with TV.

SUMMARY

Parents need to defend their child's right to develop their potential as a responsible citizens by limiting TV, covieing and discussing TV programs, keeping TV out of their child's bedroom, turning off the TV during dinner time, and turning off violent TV programs. Also, parents should use the V-chip to keep unwanted programs out of the home. Parents should encourage their children to develop physical and mental skills by engaging in developmentally appropriate activities and extracurricular school activities. Finally, parents should use TV as a communication tool to enhance their child's potential, not an electronic babysitter.

Point Versus Counterpoint: Media and Children

Media ranging from television, radio, Internet, email, and video games are universally available. They function as important communication, education, and entertainment tools. However, the question is how would you like your children to spend the 1,000 hours the average child spends each year engaged with media? Balancing the advantages and disadvantages of media requires active parent oversight.

At best, TV, the "great equalizer," offers a wide variety of programming: up-to-date news, weather, and sports; quality programs like *Sesame Street*, entertainment; and opportunities to expand one's knowledge about a topic. At its worst, TV exposes children to violence, bigotry, and profanity as well as distracting children from more meaningful activities. What's bad about TV? At the least, time devoted to consuming media can usurp family time as well as study time, and exercise time. Critics claim the "great antisocializer" is a contributing factor to the violence in our society. The American Psychological Association takes the positions that viewing violence begets violence and that viewing violence was one of four factors contributing to violence in the schools.

Oliver (2002) reviewed studies showing that individuals select different forms of media based on their individual traits such as need for cognition, sensation seeking, empathy, and aggressiveness. For example, people who score high on authoritarianism enjoy reality-based police programs. Oliver found that people select, interpret, and recall events that support their views. Huesmann and colleagues (1984) concluded that televised violence may affect any child regardless of his or her level of aggression. They also indicated that elementary children became more aggressive when they consistently watched TV violence, identified with aggressive TV characters, believed TV violence was real life, and struggled academically.

Ferguson (2002) defends the media, pointing out that the American culture itself is a violent one. He argued that the research effect sizes are small and account for only 1.2% to 9.6% of the variance in violent behavior.

While people might debate the advantages and disadvantages of television, parents as first teachers must decide in favor of their children's best interests. Parents must actively discuss with their children the advantages and disadvantages of television and other media. Kurz (2001) stated that educators should support National TV-Turnoff week because of the television's adverse effects.

—Albert F. Hodapp and Joan B. Hodapp

See also Aggression; Computer Technology; Homework; Latchkey Children; Parenting; Violence in Schools

REFERENCES AND FURTHER READING

- Cantor, J. (1998). *"Mommy, I'm scared:" How TV and movies frighten children and what we can do to protect them*. San Diego, CA: Harcourt Brace.

- Cunningham, A. E., & Stanovich, K. E. (1998, Spring/Summer). What reading does for the mind. *American Educator*, 8–15.
- DeGaetano, G., & Bander, K. (1996). *Screen smarts: A family guide to media literacy*. Boston: Houghton Mifflin.
- Ferguson, C. J. (2002). Media violence: Miscast causality. *American Psychologist*, 57, 446–447.
- Fisch, S. M. (2002). Vast wasteland or vast opportunity? Effects of educational television on children's academic knowledge, skills, and attitudes. In J. Bryant & D. Zillman (Eds.), *Media effect: Advances in theory and research* (2nd ed., pp. 397–426). Mahwah, NJ: Erlbaum.
- Gentile, D. A., & Walsh, D. A. (2002). A normative study of family media habits. *Applied Developmental Psychology*, 23, 157–178.
- Huesmann, L. R., Lagerspetz, K., & Eron, L. C. (1984). Intervening variables in the TV-violence-aggression relation: Evidence from two counties. *Developmental Psychology*, 20, 746–775.
- Huesmann, L. R., Moise-Titus, J., Podolski, C-L., & Eron, L. D. (2003). Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977–1992. *Developmental Psychology*, 39, 201–221.
- Huston, A. C., Anderson, D. R., Wright, J. C., Linebarger, D. L., & Schmitt, K. L. (2001). Sesame Street viewers as adolescents: The recontact study. In S. M. Fisch & R. T. Truglio (Eds.), *"G" is for growing: Thirty years of research on children and Sesame Street*. Mahwah, NJ: Erlbaum.
- Jason, L. A., & Hanaway, L. K. (1997). *Remote control: A sensible approach to kids, TV, and the new electronic media*. Sarasota, FL: Professional Resource Press.
- Kaiser Family Foundation. (2001, July). *Parents and the V-chip 2001: A Kaiser Family Foundation survey*. Menlo Park, CA: Author. Available online at <http://www.kff.org>
- Keith, T. Z., Reimers, T. M., Fehrmann, P. G., Pottebaum, S. M., & Aubey, L. W. (1986). *Journal of Educational Psychology*, 78, 373–380.
- Kurz, J. (2001, March). Turn off TV-turn on life. *Communique*, 32.
- Oliver, M. B. (2002). Individual differences in media effects. In J. Bryant & D. Zimmerman (Eds.), *Media effects: Advances in theory and research*. (2nd ed., pp. 507–523). Mahwah, NJ: Erlbaum.
- Parke, R. D., & Slaby, R. G. (1983). The development of aggression. In P. H. Mussen (Series ed.). *Handbook of child psychology* (Vol. 4). New York: John Wiley.
- Wright, J., Huston, A. C., Scantlin, R., & Kotler, J. (2001). The early window project: *Sesame Street* prepares children for school. In S. M. Fisch & R. T. Truglio. *"G" is for growing: Thirty years of research on children and Sesame Street*. Mahwah, NJ: Erlbaum.

MEMORY

Memory is the ability to encode, process, and retrieve information. As a skill, it is inseparable from

intellectual functioning and learning. Individuals deficient in memory skills would be expected to have difficulty on a number of academic and cognitive tasks. Although memory is linked to performance in several academic (e.g., reading) and cognitive (e.g., problem solving) areas, it is critical for learning for three reasons (Swanson & colleagues, 1998). First, it reflects applied cognition; that is, memory functioning reflects all aspects of learning. Second, several studies suggest that the memory skills used by students do not exhaust, or even tap, their ability; therefore, we need to discover instructional procedures that capitalize on that untapped potential. Finally, several cognitive intervention programs that attempt to enhance the overall cognition of children and adults rely on principles derived from memory research.

MODELS OF MEMORY

Most research on memory, whether of developmental or instructional interest, draws from information processing literature because it contains the most influential model in cognitive psychology to date. The information processing model focuses on how input is transformed, reduced, elaborated, stored, retrieved, and used. The central assumptions of the model are:

- A number of operations and processing stages occur between a stimulus and a response.
- The stimulus presentation initiates a sequence of stages.
- Each stage operates on the information available to it.
- These operations transform the information in some manner.
- This new information is the input to the succeeding stage.

One popular means of explaining cognitive performance is by drawing upon fundamental components that are inherent in most models of information processing. Three components are fundamental:

1. *Constraint or structural component*—This is akin to the hardware of a computer, which defines the parameters within which information can be processed at a particular stage (e.g., sensory storage, short-term memory, working memory, long-term memory).

2. *Strategy component*—This is akin to the software of a computer system, which describes the operations of the various stages.
3. *Executive component*—This is overseeing and monitoring learners' activities (e.g., strategies).

This model views information as flowing through component stores in a well-regulated fashion, progressing from the sensory register, to short-term memory, and finally to long-term memory. These stores can be differentiated in children's functioning by realizing that:

- Short-term memory has a limited capacity, and thus makes use of rehearsal and organizing mechanisms.
- Storage in long-term memory is mostly semantic (e.g., by using categorical taxonomies or associations).
- Two critical determinants of forgetting in long-term memory are item displacement (new incoming items replace old items) and interference (relevant items cannot be discriminated from irrelevant items), possibly as a result of a lack of retrieval strategy.

Some researchers argue for a connectionist model of information processing, whereby learning and memory occur over repeated associations (i.e., strength of activations) rather than stages or storage compartments. Such an activation model suggests that the focus on short-term memory or on long-term memory storage is not as important as a memory system based on the strength of associations, whereby associations are built on phonetic, semantic, and/or visual-spatial information. For example, frequent or common words are easier to remember than infrequent or uncommon words because of their repeated occurrence, familiarity, and association with other items.

Others' perspectives focus on working memory. Working memory is viewed as a more dynamic and active system because it simultaneously focuses on processing and storage demands, whereas short-term memory focuses primarily on the storage of information and is considered a more passive system. Baddeley (1986) describes working memory as a limited-capacity central executive that interacts with a set of two passive storage systems used for temporary storage of different classes of information: the speech-based

phonological loop and the visual sketch pad. The phonological loop is responsible for the temporary storage of verbal information; items are held within a phonological store of limited duration, and the items are maintained within the store via the process of articulation. The sketch pad is responsible for the storage of visual-spatial information over brief periods and also plays a key role in the generation and manipulation of mental images. The central executive is primarily responsible for coordinating activity within the cognitive system, but it can also devote some of its limited capacity to increasing the amount of information that can be held in the two subsystems. For example, to read words one must monitor (executive system) the accessing of phonological representations (phonological loop) as well as orthographic features (sketch pad).

RESEARCH ON MEMORY, LEARNING DIFFICULTIES, AND INTERVENTION

The study of memory in students with learning difficulties has been strongly influenced by the hypothesis that variations in memory performance are rooted in the children's acquisition of mnemonic strategies (Swanson & colleagues, 1998). An example of a mnemonic strategy is the recall of number sequences (1, 2, 3, 4) using a rhyme (e.g., 1-2 buckle my shoe, 3-4 shut the door). Strategies are deliberate, consciously applied procedures that aid in the storage and subsequent retrieval of information. Most strategy training studies that include children can trace their research framework back to earlier research on metacognition and/or research on production deficiencies by Flavell (1970). Metacognition refers to knowledge of general cognitive strategies (e.g., rehearsal); awareness of one's own cognitive processes; the monitoring, evaluating, and regulating of those processes; and beliefs about factors that affect cognitive activities. In this research, a distinction is made between the concepts of mediational and production deficiencies.

Mediational deficiencies mean the inability to use strategies efficiently. For example, young children may not spontaneously produce a potential mediator to process task requirements, but even if they did, they would fail to use it efficiently to direct their performance.

Production deficiencies suggest that children can be taught efficient strategies that they fail to produce spontaneously and that these taught strategies direct and improve their performance. An example of a

production deficiency is when a child is taught a strategy to remember information from a passage, but fails to use that strategy. However, when prompted by the teacher to use the strategy the child's remembrance of information improves. In contrast, a mediation deficiency occurs when the child uses a powerful strategy to remember information, but the strategy fails to improve their performance.

A large body of research suggests that remembering becomes easier with age because control processes become more automatic through repeated use. Control processes in memory reflect choices as to which information to scan as well as choices of what and how to rehearse and/or organize information. Rehearsal refers to the conscious repetition of information, either vocally or subvocally, to enhance recall at a later time. Learning a telephone number or a street address illustrates the primary purpose of rehearsal. Other control processes include organization (such as ordering, classifying, or tagging information to facilitate retrieval) and mediation (such as comparing new items with information already in memory). Various organizational strategies studied that have been linked to helping children with learning difficulties include:

- *Chunking*—Grouping items so that each one brings to mind a complete series of items (e.g., grouping words into a sentence)
- *Clustering*—Organizing items into categories (e.g., animals, furniture)
- *Mnemonics*—Idiosyncratic methods for organizing information (e.g., associating items to be remembered with people known to the person)
- *Coding*—Varying the qualitative form of information (e.g., substituting pictures for words)

Studies have also been directed to procedures to help children with learning difficulties mediate information, such as:

- Using preexisting associations, thereby eliminating the need for new ones
- Using instructions, asking the student to mediate information verbally or through imagery, to aid in organization and retrieval
- Employing cuing, using verbal and imaginary cues to facilitate recall

An example of a study to enhance mediation of information was provided by Mastropieri and colleagues (1985). They conducted two experiments in

which adolescents with learning disabilities recalled the definitions of vocabulary words according to either a pictorial mnemonic strategy (the keyword method) or a traditional instructional approach. The keyword method involved constructing an interactive visual image of the to-be-associated items. For example, to remember that the English word *carlin* means old woman via the keyword method, the learner is directed notice that the first part of *carlin* is the familiar word "car." Then the learner constructs an interactive image that relates a car and an old woman, such as an elderly woman driving an old car. The results indicated that the keyword strategy was substantially more effective than the traditional approach.

Pressely (1994) states that good memory performance is a product of strategies, knowledge, metacognition, motivation, and capacity. None of these factors operates in isolation, but rather effective cognition is a product of all these components and interactions. Sometimes strategic processing will be more prominent in cognition than other factors, sometimes relating content to prior knowledge will be the most salient mechanism, and still on other occasions there will be obvious reflections by a child on the task demands (on what he or she knows how to do in this particular situation or situations similar to it that have been encountered in the past). Sometimes metacognition is the more salient component used by the child when performing a task. Sometimes the child's motivation will be especially apparent, and if observed at that time, the observer would report that the individual succeeded simply by trying hard.

Based on extensive literature (Swanson & colleagues, 1998), some very practical concepts and principles from memory research can serve as guidelines for the instruction of students with learning difficulties. Effective instruction must entail information about a number of strategies, about how to control and implement those procedures, and about how to gain recognition of the importance of effort in producing successful performance. Furthermore, any of these components taught in isolation are likely to have a rather diminished value in the classroom context.

—H. Lee Swanson

See also Learning; Learning Disabilities; Mastery Learning; Mathematics Interventions and Strategies; Neuropsychological Assessment; Reading Interventions and Strategies; Spelling Interventions and Strategies; Writing Interventions and Strategies

REFERENCES AND FURTHER READING

- Baddeley, A. D. (1986). *Working memory*. London: Oxford University Press.
- Flavell, J. H. (1970). Developmental studies of mediated memory. In H. W. Reese & L. P. Lipsitt (Eds.), *Advances in child development and child behavior* (Vol. 5, pp. 181–211). New York: Academic.
- Mastropieri, M. A., Scruggs, T. E., Levin, J. R. Gaffney, J., & McLoone, B. (1985). Mnemonic vocabulary instruction for learning disabled students. *Learning Disability Quarterly*, 8, 57–63.
- Pressley, M. (1994). Embracing the complexity of individual differences in cognition: Studying good information processing and how it might develop. *Learning & Individual Differences*, 6, 259–284.
- Swanson, H. L., Cooney, J., O'Shaughnessy, T. (1998). Memory. In B.Y.L. Wong (Ed.), *Understanding Learning Disabilities* (2nd ed., pp. 107–162). San Diego, CA: Academic.

MENTAL AGE

Mental age (MA) is also known as an age norm, age equivalent score, or test age. It is defined as the age at which an individual performs on an intelligence test (Sax, 1997). For instance, a person who obtains the same number of points on an intelligence test as the average 8-year-old child is said to have a mental age of 8 years. A person's mental age does not necessarily correspond to his or her chronological age. Thus, a 7-year-old who obtains the same number of points as the average 11-year-old is said to have a mental age of 11 years.

The concept of mental age was introduced by Alfred Binet and Theodore Simon in 1908. Binet and Simon measured mental age by developing questions that would predict academic achievement. Earlier intelligence tests divided the mental age by the chronological age and multiplied this number by 100 in order to determine the intelligence quotient (IQ). Using this formula, a person's IQ was a person's mental age relative to his or her chronological age. Today, this formula is generally not used to obtain an IQ score because it does not take into account the "age of arrest," which means that intelligence levels off in adulthood.

When performance on intelligence tests is examined throughout a person's lifetime, it is found that there is an increase in a person's scores throughout childhood and adolescence, a flattening effect when a

person is in their teens or early twenties, and a decrease in performance after this time. Therefore, IQ tests today produce a mental ability score based on a person's performance relative to the performance of similar-age peers.

An additional problem with MA is that mental age units are not equal throughout the developmental period because mental growth does not occur at an equal rate across ages. For example, a child develops at a much higher rate between the ages of 2 and 3 years than between the ages of 11 and 12 years. For this reason, test scores vary more at different ages, thus making accurate interpretation of mental age scores difficult if not impossible. Another limitation of using mental age is that a global mental age does not accurately reflect the differences in a person's skills and abilities. It cannot tell you, for instance, that a person scored significantly better on tasks of a verbal nature, but performed poorly on nonverbal tasks. Despite the limitations of using mental age in interpreting test scores, mental age continues to be used because it is an interpretation that is widely understood by the general public.

—Rebecca Miller

See also Mental Retardation; Social Skills; Theories of Human Development

REFERENCE AND FURTHER READING

- Sax, G. (1997). *Principles of educational and psychological measurement and evaluation* (4th ed.). Belmont, CA: Wadsworth.

MENTAL RETARDATION

The most widely used definition of mental retardation (MR) in the United States is:

Mental retardation is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.

This definition is from the American Association of Mental Retardation (AAMR), which has had

responsibility for defining mental retardation since 1921 (Luckasson & colleagues, 2002).

Intellectual functioning is generally assessed by means of a standardized intelligence test, resulting in an intelligence quotient (IQ). The IQ must be below 70 or 75 for a person to be considered mentally retarded. Adaptive behavior or skills include conceptual (e.g., receptive and expressive language), social (e.g., interpersonal skills), and practical (e.g., personal self-help skills). Adaptive skills can be assessed by adaptive behavior scales, observations, and anecdotal records. When applying this definition, AAMR states that professionals must consider the following five assumptions:

1. Limitations in present functioning must be considered within the context of community environments typical of the individual's age, peers, and culture.
2. Valid assessments must consider cultural and linguistic diversity as well as differences in communication, sensory, motor, and behavioral factors.
3. Limitations often coexist with strengths within an individual.
4. Descriptions of limitations help develop a profile of needed supports.
5. Life functioning of a person with mental retardation will generally improve with appropriate personalized supports over a sustained period.

Once a person has been identified as an individual with MR, AAMR advocates determining the level of supports (intermittent, limited, extensive, pervasive) needed to provide the person with the ability to function as independently as possible within the community. Intermittent supports are episodic or short-term (*as needed*), and may be either low or high intensity. The key factor to limited support is consistency despite less time, fewer staff, and/or lower costs. Extensive supports occur regularly and are not time-limited. Pervasive supports are both constant and high intensity, involve more staff, are the most intrusive, and occur in the most environments. Thompson and colleagues (2004) developed the *Supports Intensity Scale* to assist professionals in determining the level of support needs for an individual in seven areas of competence: home living, community living, lifelong

learning, employment, health and safety, social interaction, and protection and advocacy (e.g., protecting self from exploitation, exercising legal responsibilities). Additional information is also gathered on exceptional medical (e.g., respiratory care, skin care) and behavioral needs (e.g., self-directed destructiveness, sexual). The composite score from the scale is used to determine the need for supports and the level of intensity.

Another frequently used definition for MR is provided by the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (1994), which provides thorough diagnostic criteria for medical and health care professionals in the United States. The *DSM-IV* version is based on the 1992 AAMR definition, but it retains the levels of severity (mild, moderate, severe, and profound) used in the 1972 AAMR definition. Approximately 85% of individuals classified as mentally retarded fall within the mild range (IQ from 50–55 to approximately 70), 10% fall within the moderate range (IQ 35–40 to 50–55), 3% to 4% fall within the severe range (IQ 20–25 to 35–40), and 1% to 2% fall within the profound range (IQ below 20–25). Deficits must also occur in at least two of the following adaptive functioning areas: communication, health, leisure time, safety, school, self care, social, taking care of a home, and work. Again, age of onset must occur before age 18 years.

MR is also defined by programs mandated and funded by the U.S. government. The AAMR definition is closely linked to the federal definition found in the Individual with Disabilities Education Act (IDEA) (1997), which is the major special education law in the United States. Students determined eligible under the category of MR qualify for special education and related services.

While various definitions emerged and changed in the 1990s, a hot debate has ensued over whether the term *mental retardation* itself is appropriate. Self-advocates, along with family members and professionals, have argued passionately for a change in language to something less degrading and stereotyping. Other terms currently used include intellectual disability and cognitive disability/delay. The President's Committee on Mental Retardation is now The President's Committee for People with Intellectual Disabilities. This name change reflects a tremendous shift from looking at the disability to focusing on people. Members of AAMR voted to maintain the

Table 1 Selected Causes of Mental Retardation

<i>Chromosomal</i>	<i>Prenatal</i>	<i>Metabolic</i>	<i>Perinatal & Postnatal</i>	<i>Genetic</i>
<ul style="list-style-type: none"> • Angelman syndrome • Down syndrome • Fragile X syndrome • Klinefelter's syndrome • Prader-Willi syndrome • Rett syndrome • Williams syndrome 	<ul style="list-style-type: none"> • Maternal malnutrition • Folic acid deficiency • Maternal infections • Congenital rubella • HIV • Toxoplasmosis • Maternal substance abuse • Fetal alcohol syndrome (FAS) 	<ul style="list-style-type: none"> • Phenylketonuria (PKU) 	<ul style="list-style-type: none"> • Encephalitis • Trauma • Difficult or complicated birth • Prematurity • Severe head injury • Malnutrition • Severe emotional neglect or abuse • Exposure to lead • Exposure to mercury 	<ul style="list-style-type: none"> • Tay-Sachs disease • Microcephaly • Hydrocephalus

term mental retardation in their association name and journal title (*The American Journal on Mental Retardation* and *Mental Retardation*, respectively), while members of the Council for Exceptional Children (CEC) in 2002 renamed the Division on Mental Retardation and Developmental Disabilities to the Division on Developmental Disabilities (DDD). As a result, the division's journal became *Education and Treatment in Developmental Disabilities*, replacing *Education and Treatment in Mental Retardation and Developmental Disabilities*. Smith (2003) felt this was a critical, first step in "abandoning the myth of mental retardation" (p. 361). CEC-DDD continues to affirm its commitment to all individuals who experience a need for mild to extensive supports.

ETIOLOGY OF MENTAL RETARDATION

MR occurs for a number of reasons, some genetic or hereditary, others the result of poor maternal nutrition or prenatal toxicity, and still others for no known identifiable cause. Some argue that knowing the etiology of MR does not enhance the ability to provide educational services or other forms of support and simply provides an unnecessary label. Research, however, suggests that even subtle differences among various syndromes can lead to a better understanding and thus better services. Table 1 lists some of the most common known reasons for MR. Yet, even within a particular syndrome, the severity of MR can vary greatly. Generally, the more severe the MR the earlier it is detected. Often children are not classified as having mild MR until they fall behind in school. MR can

also occur in combination with another type of disability. Often there are medical, physical, and/or mental health problems as well. As noted earlier, in order to be classified as having MR, there must be deficits in adaptive behavior. Therefore, persons with MR will experience problems with communication, social, motor, and/or self-help skills.

EDUCATIONAL SERVICES FOR STUDENTS WITH MENTAL RETARDATION

According to the Twenty-fourth Annual Report to Congress on the Implementation of the Individuals With Disabilities Education Act (U.S. Department of Education) (2002), slightly less than 1% of children, ages 6 to 21 years are mentally retarded. When compared to other students with disabilities served under the Individuals With Disabilities Education Act (IDEA), 10.6% of the students were labeled mentally retarded—the third largest category. Specific learning disabilities and speech or language impairments were higher.

Despite gains in the use of tests that are culturally and linguistically nonbiased, African American children are still overrepresented in special education under the category of MR, whereas students of Hispanic origin have lower rates of identification. Similarly, advocates of inclusion or integration of students with disabilities into general education settings have not achieved as much as has been anticipated for children who are mentally retarded, especially older students. Most students (ages 6–21 years) are educated in public schools with very few

served in separate public or private facilities, residential facilities, and home/hospital environments. Within a school setting, half of these 6- to 21-year-old students with MR are served outside the regular classroom 60% or more of the time.

HISTORICAL PERSPECTIVE

Services and education for individuals with MR began in Europe and were brought to the United States by Edouard Seguin, a French physician who had studied under Jean-Marc Gaspard Itard (famous for his groundbreaking study of Victor, Wild Boy of Aveyron) and Jean-Etienne Dominique Esquirol. Esquirol categorized "intellectual deficiency" into idiots and imbeciles. Imbeciles could develop to a certain extent, while someone classified as an idiot demonstrated little skill, thought, or use of their senses. Later the terms moron, feeble-minded, and borderline would be added to explanations and classification structures used to describe individuals with cognitive delays. Seguin collaborated with Samuel Howe, who opened the Massachusetts School for Idiotic and Feeble-Minded Youth in 1848 as an experimental boarding school. The success of this school and others to provide an education offered hope to parents and led many to advocate for the establishment of state training schools. Unfortunately, these early schools led to large, impersonal institutions where children and adults received less than adequate care, education, and training. However, Seguin's educational approach is still felt today.

The widespread development of institutions coincided with the worldwide eugenics movement and the development of standardized intelligence testing. It would take more than 100 years for society to recognize the injustice perpetuated by institutionalization and subsequent forced sterilization. In 2002, Governor Mark Warner of Virginia became the first to offer an official apology for the gross abuse of human rights of those who were poor, mentally ill, or mentally retarded in the name of eugenics, as well as the faulty reasoning behind the intent to wipe out hereditary disorders and human shortcomings. Four other governors (Oregon, California, North Carolina, and South Carolina) followed suit. Physicians in a total of 33 states conducted more than 65,000 sterilizations of men, women, boys, and girls. State laws permitting forced sterilization were modeled after Virginia's. Although some states have repealed their eugenics

laws, the Supreme Court ruling in *Buck v. Bell* (1927) still stands.

Much shame and misguided advice by medical practitioners led many parents to place their children in institutions or to hide their children away at home. The trend began to change when Pearl S. Buck, a renowned author, wrote a book about her daughter, Carol, born in 1920, who was mentally retarded. *The Child Who Never Grew* first appeared in 1950 and provided parents with hope and affirmation of all they had felt and been through. Dale Evans Rogers, wife of Roy Rogers, also wrote a moving story entitled *Angel Unaware* (1953, 1984) about their daughter, Robin, who was born with Down syndrome and only lived for two years. Both women were well known and respected. Their heartfelt stories of their daughters touched many lives. For the first time, many felt they could openly discuss their children with MR. The closet door was opening. Public awareness and acceptance became even greater when President John F. Kennedy and his family, particularly his sister, Eunice Shriver, championed the rights of individuals with MR. Their sister Rosemary, an individual with mental retardation, served as the impetus. President Kennedy initiated the President's Panel on Mental Retardation in 1961, and Eunice Shriver redefined athletic competition with the founding of the Special Olympics in 1968. Society would never again view individuals with MR as totally incapable. Spurred by U.S. Senator Robert Kennedy's tour of several institutions in Massachusetts and the ensuing reports in the news media, Blatt and Kaplan (1966; reprinted in 1974) published *Christmas in Purgatory: A Photographic Essay on Mental Retardation*. This book provided the general public with a stark view of the reality of life in the institution. It was not a pretty picture.

Several states have enacted laws allowing for the death penalty in cases where the defendant is an individual with MR. The State of Virginia again played a role in another landmark decision by the U.S. Supreme Court when the court ruled on June 20, 2002, in the case of *Atkins v. Virginia*, that it was unconstitutional to execute individuals with MR. James W. Ellis, a law professor at the University of New Mexico Law School and past president of AAMR, represented Atkins and has written a guide for state legislatures to assist in implementing the *Atkins* decision. Unfortunately, a number of people with MR remain in the criminal justice system. Their disability often works against them when arrested or confronted by law

enforcement officers (Davis, 2000). Also, persons with MR are twice as likely to be a victim of criminal activity. Law enforcement officers, members of the criminal justice system, and advocates need to work together to understand the nuances of working with offenders and victims who have MR.

TRENDS IN EDUCATION AND SERVICE

The civil rights movement in the United States spawned a “disability rights” movement. *Brown v. the Board of Education* (1954) became a legal landmark in the desegregation of schools. Schools could no longer deny admittance or segregate children based on race or ethnicity. Seventeen years later in the *Pennsylvania Association for Retarded Citizens (PARC) v. Commonwealth of Pennsylvania* (1971) case, it was successfully argued that all children, regardless of mental age, were entitled to a free and appropriate public education in the least restrictive environment. A free and appropriate public education (FAPE) would become the hallmark of educational services for individuals with disabilities. Access to education was the key to opening the future for individuals with MR. Deinstitutionalization and the passage of the Education for All Handicapped Children Act in 1975, now known as IDEA, helped to solidify the process of integrating persons with MR into their communities and to provide families with necessary supports to keep their children at home, to receive a free and appropriate public education, and to prepare them for adult life as contributing members of society.

The need to speak for themselves, have choices, and participate in decision making has been a critical component of the disability rights movement, especially for individuals with MR. Acquiring self-determination skills supports the notion that individuals with MR can and should make choices about a number of aspects resulting in autonomy (Drew & Hardman, 2004). Learning self-determination skills should start at a young age and continue throughout life. Additionally, parents and professionals should assist students and adults in recognizing options from an array of choices, understanding potential consequences of their choices, following through, analyzing results, and making any necessary adjustments in the future.

As people with MR achieve stable and longer lives, there is a growing demand for services coupled with issues related to aging caregivers, nutrition, and



access to health care services (Rizzolo & colleagues, 2004). The closing of large institutions created a need for smaller, community-based options. Long waiting lists and a lack of suitable options created serious problems in finding places for individuals with MR to reside once their families could no longer care for them. It appears that individuals with MR will live into retirement and outlive their parents. Unfortunately, when deinstitutionalization occurred, planning for adequate health care within the community did not take place. Children with MR live with chronic emotional, behavioral, developmental, or physical problems and thus use more health care and related services (Krauss & colleagues, 2003). More than 20% of children with MR, whose parents completed a national survey, had problems accessing health care, especially in getting referrals and finding well-trained providers. If the parent was also in poor health, the child was at greater risk. However, those who had Medicaid coverage and other public health coverage encountered few problems. Medical providers (e.g.,



dentists, nurses, ophthalmologists, physicians, psychologists) need more training to work with patients with MR, and individuals with MR need to acquire skills to communicate with their health care providers and have the opportunity to express their opinions about the health care system and how it might be improved.

Individuals with MR struggle against negative perceptions, prejudice, and lack of options. Strong advocates, legislation, and litigation have helped people with the label of mental retardation fight for dignity and respect, gain access to education and community services, and pursue options to assure a full and satisfying life. Professionals, parents, and self-advocates have learned that despite limits in cognitive ability and adaptive skills, individuals with MR do learn, and they can lead satisfying lives as contributing members of society.

In the early 1900s a child with Down syndrome, Gail Boger, was born into a family in Missouri. He was the youngest of three children and the author's great uncle. This child remained at home until his death at the age of 12 years (Photo 1). Although this sounds young, the average life expectancy of a person with Down syndrome at that time was only nine years (Rizzolo & colleagues, 2004). He did not go to

school, but instead he learned skills at home. While his life coincided with an increase in the institutionalization of children and adults considered "feeble-minded" and the eugenics movement, his parents chose instead to keep him at home and honor his place in the family with a pictorial record.

The 1970s saw a shift in attitudes as the deinstitutionalization movement began in full force. By the 1980s, when Mike Duarte was born (Photo 2), possibilities and educational opportunities had dramatically shifted. Mike grew up alongside his two sisters in his family home, where he still lives. He attended an early intervention program, began kindergarten at age 5 years, and was included in general education classrooms (where he worked on functional life skills) until he exited the school system at age 21 years. During the course of his education, he learned to interact with his same-age nondisabled peers, in other words he made friends; acquired independent self-help skills; became responsible enough to stay at home unsupervised for moderate lengths of time; learned to ride public transportation; acquired numerous leisure skills; and began to explore vocational options. Currently, Mike and his parents are working with Vocational Rehabilitation and local community providers to determine an appropriate vocational path and provide him with ongoing support and services. While Mike will most likely not experience the level of independence seen in his sisters, he will continue to have a meaningful life. Those closest to him continue to offer support and strive to help him achieve his dreams and reach his potential.

As Gold (1980) so eloquently stated, mental retardation has never really been something that resides within a person. Rather, mental retardation and its perceived level of severity correlate solely to society's ability and willingness to provide education, training, and supports. With adequate levels of support, any individual can learn and become a valuable, contributing member of society.

—Christine Macfarlane

See also Academic Achievement; Intelligence; Learning; Retention and Promotion

REFERENCES AND FURTHER READING

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

- Atkins v. Virginia, 536 U.S. 304 (2002).
- Blatt, B., & Kaplan, F. (1974). *Christmas in purgatory. A photographic essay on mental retardation*. Syracuse, NY: Center on Human Policy Press.
- Brown v. Board of Education, 347 U.S.483 (1954).
- Buck, P. S. (1950, 1992). *The child who never grew*. Bethesda, MD: Woodbine House.
- Buck v. Bell, 274 U.S. 200 (1927).
- Davis, L. A. (2000). *People with mental retardation in the criminal justice system*. Silver Springs, MD: The Association for Retarded Citizens (ARC).
- Drew, C. J., & Hardman, M. L. (2004). *Mental retardation: A lifespan approach to people with intellectual disabilities* (8th ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.
- Education for All Handicapped Children Act, Public Law 94-142, Title 34 C.F.R. 301.1 (1975).
- Ellis, J. W. (n.d.). *Mental retardation and the death penalty: A guide to state legislative issues*. Retrieved June 26, 2004, from <http://www.deathpenaltyinfo.org/MREllisLeg.pdf>
- Gold, M. W. (1980). *Try another way manual*. Champaign, IL: Research Press.
- Individuals With Disabilities Education Act (IDEA), Public Law 105-17, Title 34 C.F.R. 300 (1997).
- Krauss, M. W., Gulley, S., Sciegaj, M., & Wells, N. (2003). Access to specialty medical care for children with mental retardation, autism, and other special health care needs. *Mental Retardation, 41*, 329-339.
- Luckasson, R., Borthwick-Duffy, S., Buntinx, W. H. E., Coulter, D. L., Craig, E. M., Reeve, A., et al. (2002). *Mental retardation: Definition, classification, and system of supports* (10th ed.). Washington, DC: American Association on Mental Retardation.
- Pennsylvania Association for Retarded Citizens v. Commonwealth of Pennsylvania, 334 F. Supp. 1257 (E.D.PA, 1971).
- Rizzolo, M. C., Hemp, R., Braddock, D., & Pomeranz-Essley, A. (2004). *The state of the states in developmental disabilities*. Washington, DC: American Association on Mental Retardation.
- Rogers, D. E. (1953, 1984). *Angel unaware*. Grand Rapids, MI: Fleming H. Revell.
- Smith, J. D. (2003). Abandoning the myth of mental retardation. *Education and Training in Developmental Disabilities, 38*, 358-361.
- Thompson, J. R., Bryant, B. R., Campbell, E. M., Craig, E. M., Hughes, C. M., Rotholz, D. A., et al. (2004). *Supports Intensity Scale (SIS)*. Washington, DC: American Association on Mental Retardation.

MENTORING

Mentoring is a relationship in which an older person provides ongoing guidance, instruction, and

encouragement to another, younger individual, usually a youth, with the goal of further developing that individual's competence and character (Rhodes, 2002a). Typically viewed as older and wiser, *mentors* develop supportive relationships with younger youth, who are referred to as *mentees* or *protégés*.

NATURAL VERSUS PROGRAM-BASED MENTORING

A major distinction in the definition of mentors and mentoring relationships is between natural mentors and program-based mentors. Natural mentoring, as the name suggests, emerges naturally. Youth often develop natural mentoring relationships with adults who pay special attention to them, and who provide guidance, encouragement, and a sympathetic ear. In the context of school, natural mentors may include teachers, coaches, counselors, psychologists, administrators as well as many other "older and wiser" individuals. Outside of schools, youth may develop natural mentoring relationships with adults in their extended family, neighborhood, religious organizations, and in recreational settings.

Program-based mentoring refers to a formalized process by which an organization recruits an individual to serve as mentor to a youth. The adult and youth usually have had no prior contact or relationship, and their interaction results from being matched together in a mentoring relationship. Big Brothers Big Sisters (BBBS) of America is the largest formal mentoring program in the United States and has been actively recruiting adults to work with youth as mentors for 100 years. Initially, BBBS recruited men to work with boys from fatherless homes, but today this organization serves both boys and girls and reaches beyond those from single-parent homes to support the development of competence and character of youth from a variety of settings.

COMMUNITY-BASED VERSUS SCHOOL-BASED MENTORING PROGRAMS

The context of mentoring plays a significant role in shaping the nature of program-based mentoring relationships. The majority of mentoring programs are based on or originate in the community through BBBS and other organizations such as Boys and Girls Clubs of America and the Young Men's and Young Women's Christian Associations (YMCA and

YWCA). However, schools also have emerged as a viable context for mentoring. Some advantages of school-based mentoring programs include significantly lower operational costs. Herrera and colleagues (2000) estimate school-based programs cost approximately half as much as community-based programs. School-based programs also provide increased access to youth, and greater opportunities for school staff and program coordinators to supervise mentors, as well as to provide mentors immediate support, instruction, and feedback. Mentors often prefer school-based mentoring because it is less time-consuming. Typically, school-based mentors meet with their mentees once per week for an hour, whereas community-based programs often encourage weekly meetings of three to four hours.

HISTORY OF MENTORING

The term *mentor* has held the same meaning for more than 1,000 years. The word originated from the character Mentor in Homer's *The Odyssey* (see Baker & Maguire, in press). Mentor was a trusted friend of Odysseus, the king of Ithaca. When Odysseus went to fight in the Trojan War, Mentor was asked to watch over, befriend, and provide council and support to Odysseus's son, Telemachus. For hundreds of years, adults have served as mentors to youth in work apprenticeships. However, formal mentoring programs did not emerge until the early 20th century with the help of Jane Addams and Ernest Coulter, who encouraged the juvenile courts system to address delinquency. Adults working with needy or problem youth became known as Big Brothers, long before BBBS was founded. (Big Brothers was founded in 1904, and Big Brothers and Big Sisters maintained separate identities until 1978 when they merged to become Big Brothers Big Sisters of America.). Perhaps the most public statement in support of formal mentoring programs was President George W. Bush's pledge to commit 150 million dollars to mentoring programs. Although intuitively appealing and a popular approach to intervention, there has been limited research on the effectiveness of mentoring programs to date.

MENTORING RESEARCH AND LITERATURE

In 1936, Richard C. Cabot, a Harvard-trained physician, initiated the first systematic study on the

effects of mentoring in his Cambridge–Somerville Youth Study (CSYS), which examined various intervention programs for delinquent youths (Baker & Maguire, in press). The 30-year follow-up study revealed the potentially negative effects of poorly run intervention programs that do not sufficiently counter delinquent youths' tendency to undermine authority (Dishion & colleagues, 2003). They found that youth who participated in a comprehensive intervention program that included mentoring fared worse 30 years later than youth who had not participated. These negative results, they argued, resulted from aggregating delinquent youth together in the intervention. Based on these findings and more recent studies consistent with this view, it can be argued that psychologists coordinating mentoring programs in schools should avoid including solely children viewed as at risk for underachievement or delinquency.

Until recently, the enthusiasm for mentoring has eclipsed the few systematic efforts conducted to assess whether mentoring works. The intuitively appealing nature of mentoring and concomitant enthusiasm for mentoring has been tempered by research illustrating that successful mentoring programs take a lot of work, planning, dedication, and resources (e.g., time, funding, and staff energy) to be effective. Nearly 20 years before *The Kindness of Strangers* (Freedman, 1993) heralded a wave of enthusiasm for mentoring, which crested at the end of the 20th century, Goodman (1972) conducted the first systematic study of college-age mentors to youths. This was the first study of youth mentoring to reveal its positive effects on youths' social skills, self-esteem, and relationships with other adults. Goodman's study also foreshadowed more recent research findings by revealing the importance of ongoing training and the duration of the mentoring relationship, the differential effectiveness of shy and extroverted mentors, and the impact of mentoring on the college mentors themselves. The more recent and frequently cited study of the BBBS program reveals that youths who receive mentors are less likely than those without a mentor to engage in substance use, fighting, or skipping school; and are more likely to report improved relationships with their parents (Grossman & Tierney, 1998). However, there are limitations to this study, the most significant of which is that all outcomes were self-reported by the youth. No teacher, parent, or significant adults' reports of the effectiveness of the mentoring program were collected.

The sophistication of research on mentoring's effectiveness has been increasing in recent years (Rhodes, 2002b), and now there are a number of research-based publications on mentoring (Rhodes 2002a) that balance the naïve enthusiasm of much of the earlier mentoring literature. DuBois and colleagues (2002) conducted one of the most important studies of youth mentoring. In 1999, they undertook a meta-analysis of all the available research in the field of mentoring. Among the hundreds of articles touting the potential of youth mentoring, DuBois and colleagues found that only 55 studies had comparison groups and measured outcomes before and after mentoring. The authors' study was the first systematic effort to examine the effectiveness of mentoring practices that had previously been proposed by those in the field. They tested several theoretically based "best practices," as well as other commonly used components of mentoring programs, and found that the most effective mentoring programs employed a larger number of identified mentoring best practices than did the less effective programs. Consistent with Goodman's findings, some of DuBois and colleague's best practices include the systematic matching of mentors and mentees and the provision of ongoing training and supervision to mentors. Table 1 provides a set of best practices for the mentoring field (MENTOR/National Mentoring Partnership, 2003). These best practices provide guidelines for school psychologists, counselors, teachers, and administrators who intend to develop and implement school-based mentoring programs.

Other findings revealed by DuBois and colleague's (2002) meta-analysis and more recent research (e.g., Rhodes, 2002a, 2002b) are worth noting. For example, although providing structured activities emerged as a best practice, more recent research has revealed that recreational and sport activities as well as casual discussions about family, friends, and personal issues were strong predictors of whether the mentees came to see their mentors as significant persons in their lives (DuBois & colleagues, 2002). Therefore, even in school settings, activities that promote connectedness between the mentor and mentee may be more effective at unleashing the potential effects of mentoring than academic or goal-focused activities.

School psychologists are likely to perform several roles in the development and maintenance of school-based mentoring programs. They may be responsible for identifying students who might benefit from a mentor; when they do, they should avoid selecting only students who are at risk for problem behaviors

and underachievement. Such students do not appear to be the best candidates for mentoring, and their problem behaviors may worsen as a result if gathered into a group-based intervention. School psychologists may be responsible for training and supervising the adults who work as mentors; during the training, they should attempt to incorporate as many of the best practices of youth mentoring as possible. Finally, school psychologists may be responsible for collecting data for evaluation purposes; they should begin this work by turning to the burgeoning literature on youth mentoring or the *Handbook of Youth Mentoring* (DuBois & Karcher, in press) to identify instruments and procedures specific to this important task. In program coordination and evaluation, school psychologists should include parents by facilitating contact between mentors and parents and by including parents' perspectives when assessing important outcomes. As planners, coordinators, and evaluators, school psychologists can play a central role in the development of successful youth mentoring programs.

—Michael J. Karcher, Laura Roy-Carlson,
Chiharu Allen, and Debby Gil-Hernandez

See also Intervention

REFERENCES AND FURTHER READING

- Baker, D. B., & Maguire, C. (in press). Mentoring in historical perspective. In D. L. DuBois & M. J. Karcher (Eds.), *Handbook of youth mentoring*. Thousand Oaks, CA: Sage.
- Dishion, T. J., McCord, J., & Poulin, F. (2003). When interventions harm: Peer groups and problem behaviors. *American Psychologist*, *54*, 755–764.
- DuBois, D. L., Holloway, B. E., Valentine, J. C., & Cooper, H. (2002). Effectiveness of mentoring programs for youth: A meta-analytical review. *American Journal of Community Psychology*, *30*, 157–197.
- DuBois, D. L., Neville, H. A., Parra, G. R., & Pugh-Lilly, A. O. (2002). Testing a new model of mentoring. *New Directions for Youth Development*, *93*(Spring), 21–57.
- DuBois, D. L., & Karcher, M. J. (in press). *Handbook of youth mentoring*. Thousand Oaks, CA: Sage.
- Freedman, M. (1993). *The kindness of strangers: Adult mentors, urban youth, and the new voluntarism*. San Francisco: Jossey-Bass.
- Goodman, G. (1972). *Companionship therapy: Studies in structured intimacy*. San Francisco: Jossey-Bass.
- Grossman, J. B., & Tierney, J. P. (1998). Does mentoring work? An impact study of the Big Brothers Big Sisters Program. *Evaluation Review*, *22*(3), 403–426.
- Herrera, C., Sipe, C. L., & McClanahan, W. S. (2000). *Mentoring school age children: Relationship development*

Table 1 Effective Practices in Youth Mentoring*Designing a Program*

- Design specific program goals and procedures.
- Establish an evaluation component to the mentoring program.

Initial Procedures

- Define clear roles for staff and advisors of the mentoring program.
- Establish criteria for matching youth with mentors (e.g., gender, race, interests).*
- Establish a public relations component.
- Establish a system to maintain regular contact with mentors/mentees.
- Design a plan for staff support.

Funding

- Design a financial plan (budget management, timeline, system for managing finances).
- Plan for future funding.
- Document staff information and mentor/mentee matches.

Mentor/Mentee Relationships and Participation

- Conduct mentor/mentee orientation.†
- Recruit mentors in helping roles/professions (e.g., teachers, counselors, psychologists).†
- Use screening procedures (e.g., background checks, interviews, etc.).*
- Communicate clear guidelines of where and when mentors/mentees will meet.
- Clarify expectations regarding frequency of mentor/mentee contact.*
- Clarify expectations regarding duration of relationships.*

Parental Involvement

- Conduct parent orientation.
- Encourage parent support and involvement.†
- Encourage parental feedback.

Program Implementation and Maintenance

- Supervise mentors (provide guidance from staff).*
- Monitor mentors (mentor activity logs).*
- Provide ongoing mentor support (Mentors discuss feelings/experiences with staff).*
- Provide structured activities for mentors and youth (e.g., events planned by host organization).†
- Provide ongoing training of mentors.†
- Monitor implementation.†
- Help mentors/mentees reach relationship closure.
- Reflect on and disseminate findings from the evaluation.
- Recognize contributions of program participants.

*Theory-driven best practices lacking empirical support (DuBois & colleagues, 2002).

†Empirically supported (evidence-based) best practices (DuBois & colleagues, 2002).

Adapted from MENTOR/National Mentoring Partnership. (2003). *The elements of effective practices*. Alexandria, VA: Author. (Used with permission).

in community-based and school-based programs. Philadelphia: Public Private Ventures.
 MENTOR/National Mentoring Partnership (2003, September). *Elements of effective practice* (2nd ed.). Retrieved May 12, 2004, from http://www.mentoring.org/common/effective_mentoring_practices/pdf/effectiveprac.pdf

Rhodes, J. E. (2002a). *Stand by me: The risks and rewards of mentoring today's youth*. Cambridge, MA: Harvard University Press.

Rhodes, J. E. (Ed.).(2002b). A critical view of youth mentoring [special issue]. *New Directions for Youth Development*, 93(Spring), 21–57.

MIDDLE SCHOOL

The U.S. Department of Education defines middle-level schools as involving no grade lower than fifth and no grade higher than eighth. Two generic labels are commonly used to describe middle level schools. The label “middle school” typically refers to schools comprising grades sixth through eighth; the term “junior high school” usually refers to schools having grades seventh through ninth. These differing definitions contribute to some difficulties in identifying and communicating trends in school composition.

According to the National Middle School Association (NMSA) (2003), the percentage of middle schools and the percentage of children attending them have increased dramatically since the 1970s; the reverse has occurred for junior high schools. In 1971 there were 10,445 total middle-level schools, of which 1,662 (16%) had sixth through eighth grades. In 2000 there were 14,107 middle-level schools, of which 8,371 (59%) had sixth through eighth grades. This represents an increase of 404%. In contrast, the number of grades seventh through ninth (junior high) schools decreased from 45% of the total to 5% of the total during that same time span (NMSA, 2003).

THE EVOLUTION, DEFINITION AND PURPOSE OF MIDDLE SCHOOLS

During the 1800s, the eight-four (elementary school-high school) pattern dominated education. It provided basic skills and vocational training to large numbers of students, and college preparation for some. During the late 1800s psychologists, such as G. Stanley Hall, began to identify the unique biological, social, and cognitive changes underlying early adolescent development, which then were seen as requiring educational curricula and methods different from the existing elementary and secondary forms. For example, in contrast to the high school emphases on subject mastery, early adolescents were viewed as needing a more exploratory curriculum presented in a more nurturing atmosphere that fostered personal growth.

At the same time, many educators felt that starting secondary education sooner might help stem the very high dropout rate following sixth grade. In response to these emphases, the National Education Association (NEA) recommended restructuring education programs to better prepare students for high school and

to better meet the developmental needs of early adolescents. The first junior high schools, established in Columbus, Ohio, in 1909, incorporated grades seven through nine. Although purportedly focused specifically on the needs of middle-level students, the early junior high schools provided little by way of a unique curriculum focused on the needs of developing adolescents. Nor were teachers specifically trained to deal with the issues and concerns of those leaving childhood and entering the adolescent years. A major criticism of junior high schools, then and now, is that they largely represent administrative reorganizations dividing the secondary school into different units but lacking a unique curricular approach tuned to emerging adolescents. Of note, criticisms of current middle schools are very similar.

By the late 1950s, these criticisms—along with increases in school enrollment and pressures on school enrollments because of school desegregation—fostered the development of middle schools. In 1982 and again in 1995 the NMSA published *This We Believe*, a statement of practice and philosophy of middle school education that attempted to distinguish it from junior high education. In 1989 the Carnegie Council on Adolescent Development published *Turning Points*, urging reform in middle-level education. The confluence of these events resulted in the growth of middle schools presumably based on a philosophy of education distinguishing it from junior high schools (Table 1).

THE EFFECTIVENESS OF MIDDLE SCHOOLS

One set of problems in determining if middle schools meet their goals entails research design issues, such as:

- Neither students nor teachers are randomly assigned to schools.
- There are multiple choices for the unit of analysis (e.g., the individual school versus a collection of schools).
- An appropriate comparison group (e.g., junior high schools or national norms) must be determined.

Another set of concerns centers on determining the degree to which middle schools provide the suggested curricular components, generalization to other districts, and related issues.

Table 1 Some Differences Between Middle School and Junior High School Foci and Goals

Middle School	Junior High School
Student-centered instruction	Subject-centered instruction
Creative exploring and experimenting with subject matter	Mastery of concepts and skills in separate subject matter
Intramural athletic programs	Interscholastic athletic programs
Interdisciplinary teams for instruction	Department organizational structure for instruction
Usually grades 6, 7, and 8	Usually grades 7, 8, and 9
Exploratory curriculum	Fixed curriculum
Preparation of student for continuous learning	Preparation of student for high school curriculum
Focus on student needs by teams of teachers	Focus on subject matter by individual teachers
Fostering cooperation	Fostering competition

Compiled from: Carnegie Council on Adolescent Development. (1989). *Turning points: Preparing American youth for the 21st century*. New York: The Carnegie Corporation of New York; National Middle School Association (NMSA). (1982, 1995). *This we believe: Developmentally responsive middle level schools*. Columbus, OH: Author.

In their Research Summary #12, the NMSA (1995) reported that there are some enhanced achievements and engagement in academics in middle-level students taught via team teaching methods, a hallmark of middle schools. Recent research demonstrates a critical reason teaming is related to enhanced student achievement is the emphasis on team common planning time (Vars, 1993). The greater the amount of common planning time, the better the student achievement.

Research also shows that academic success often decreases during any transition. Students who attend a K-8 school will only make a single transition, that is, to high school (Johnston & Markle, 1986). Other students may transition from elementary school to middle school, and then from middle school to high school. Educators have addressed the transition issue with the creation of transition teams and/or programs to assist students in their move from middle school to high school (Alstaugh, 1998). Research shows that SES, school size and differences in the make up of the student body can all play a role in determining success of transition programs (Clark & Clark, 1994). Transition teams can help make students and parents more aware of the upcoming changes. Support can be offered through a transition team comprised of eighth and ninth grade students, parents, and teachers to provide transitioning students with the information and assistance preceding the year of a school change and during the transition year itself.

Other research on the claimed value of middle schools, such as enhancing personal growth, allowing exploration, and achievement in specific subject areas, is sorely needed (Carnegie Council on Adolescent Development, 1989).

THE SCHOOL PSYCHOLOGIST IN MIDDLE SCHOOL

All psychologists who want to work in the schools receive special training and education in an effort to properly prepare them for the responsibilities of a school setting. Coursework and fieldwork in testing students, counseling students, providing teachers and parents with necessary workshops, consulting with faculty and parents, and assessing students' emotional and academic concerns are all a part of a school psychologist's training (Gutkin & Reynolds, 1999).

A school psychologist's responsibilities, at any grade level, vary depending on the type of students, the school district's needs, expectations of administrators, and local and federal standards. Standards can dictate how many student cases a psychologist is managing or standards may dictate the amount of time between which cases must be revisited (Hartshorne & Jacob-Timm, 1998).

A psychologist working in a middle school may be expected to understand the developmental, social, emotional, physiological, academic, and behavioral needs of young adolescents. Consistent with the

philosophy of middle schools, a middle school psychologist may regularly meet with a team of teachers when discussing the concerns of one student, because middle schools are most often designed to assign a team of teachers to each group of students. This allows for all of the adults working in the school who interact with the student to communicate and collaborate on assisting the student. Additionally, a middle school psychologist may lead groups for students on anger management, social skills, students whose parents are divorced, and other similar topics, because young adolescents are facing these issues.

Although administrators may seek out psychologists who are uniquely prepared to work in a middle school, they likely will have difficulty hiring psychologists who have specific middle school training or experience. Many school psychologists lack this expertise because training programs are not required, or designed, to prepare psychologists to work in specific school settings. A psychologist applying for a job in a middle school may have little to no training or experience working in a middle school.

Because teacher-training programs are divided among specialties in early education (K–5) and secondary education (subject specific), it is equally difficult to hire teachers with training specifically focused on teaching middle school students. Despite the educational system's movement to create middle schools and design an educational philosophy salient to young adolescents in the middle schools, training programs for both teachers and school psychologists are not addressing the training needs for these professions. If our country's desire to create middle school facilities that adhere to middle school educational philosophy sincerely exists, our country's training programs need to create curricula to prepare teachers, psychologists, and other staff to work in a middle school. This means training school staff in the middle school philosophy that is widely discussed.

CONCLUSION

The middle school movement grew during the 1950s and 1960s because of dissatisfaction with the effectiveness of junior high schools. By the 1970s the number of middle schools increased dramatically because it was felt that middle-level education needed to focus more on being exploratory, on helping young adolescents with specific developmental needs (which are different from those of children or older adolescents),

and on easing the transition to high school. Although middle schools far outnumber junior high schools, research evidence demonstrating their advantage in terms of academic achievement, personal growth, and ease of transition to high school is severely lacking. Moreover, criticisms originally raised about junior high schools, such as their being little more than miniature high schools in their curriculum and orientation toward instruction, frequently are raised about middle schools. Many would argue that the promise of middle schools has yet to be realized.

—Jerome B. Dusek and Lauren A. Arbolino

See also Theories of Human Behavior and Development

REFERENCES AND FURTHER READING

- Alstaugh, J. L. (1998). Achievement loss associated with transition to middle school and high school. *Journal of Educational Research*, 92, 20–25.
- Carnegie Council on Adolescent Development. (1989). *Turning points: Preparing American youth for the 21st century*. New York: The Carnegie Corporation of New York.
- Clark, S., & Clark, D. (1994). *Restructuring the middle level school: Implications for school leaders*. Albany, NY: State University of New York Press.
- Gutkin, T. B., & Reynolds, C. L. (1999). *Handbook of school psychology*. New York: John Wiley.
- Hartshorne, T. S., & Jacob-Timm, S. (1998). *Ethics and law for school psychologists*. New York: John Wiley.
- Johnston, J. H., & Markle, G. C. (1986). *What research says to the middle level practitioner*. Columbus, OH: National Middle School Association.
- National Middle School Association (NMSA). (1982, 1995, 2003). *This we believe: Developmentally responsive middle level schools*. Columbus, OH: Author.
- Vars, G. F. (1993). *Interdisciplinary teaching: Why and how*. Columbus, OH: National Middle School Association.

MONTESSORI SCHOOLS

Maria Montessori, born in Italy in 1870, developed her own theories of child development and learning, which serve as the foundation for Montessori schools. Montessori believed that schools should be designed to facilitate the natural development and independence of children. Given the freedom to choose their activities and work at their own pace, children take responsibility for their own learning. Opportunities for learning are

facilitated through a prepared environment that introduces specific learning materials to children based on their developmental level and interests. Once the materials are introduced to children, they are able to work with them independently thereby satisfying their inner desire to learn. Such an approach is intended to allow children to enhance their self-discipline as they mature from childhood to adulthood.

Beginning with the inception of the first Montessori school in 1907, *Casa dei Bambini*, Montessori's educational philosophy and methods have expanded to locations worldwide. In 1909, teacher training programs began in Italy and were extended to international locations several years later. Montessori developed the Association Montessori Internationale (AMI) in 1929 to ensure that her work would continue after her death in a manner consistent with her philosophy and teachings. The AMI has developed its operations to include 50 accredited training programs in 18 countries worldwide (Association Montessori Internationale, 2001). It is estimated that as many as 5,000 Montessori schools are operating in the United States alone (Ruenzel, 1997).

Children of different ages share the same Montessori classroom. Groupings often include children ages 2 months to 3 years, 3 to 6 years, and 6 to 12 years; and activities within the classroom are prepared according to the developmental level of the group. Although Montessori programs can be designed for children of all ages, much attention has been given to programs designed for children ages 3 to 6 years. Indeed, Montessori considered children in this age range to have an *absorbent mind*, which allows them to naturally and effortlessly absorb skills and abilities from their environment. To facilitate their growth, the classroom contains activities to engage children in developing their skills in five major areas:

1. Practical life or skills for daily living such as sweeping, pouring, or polishing
2. Sensory development
3. Language
4. Mathematics
5. Culture, or areas such as history, anthropology, and biology

The role of teachers in Montessori classrooms is to maintain an organized environment, arrange materials

so they are attractive to the children, present activities to the children based on individual needs, and observe the children's work and development.

Research on outcomes for children participating in Montessori schools has yielded mixed results. Some studies indicate that children in Montessori schools perform better than children in traditional preschool programs on tasks requiring creativity and school readiness. Montessori students' performance on tests related to general intelligence, academic achievement, and attention have generally not been significantly different from traditional preschool programs (Chattin-McNichols, 1981). However, conclusions from research comparisons should be viewed with caution. Differences may result from limitations in research designs rather than true differences between the programs.

—Tracey R. Bainter

See also Class Size; Learning; Motivation; Preschoolers

REFERENCES AND FURTHER READING

- Association Montessori Internationale. (2001, November). *Association Montessori Internationale training centres*. Available online at <http://www.montessori-ami.org/6training/6atraining.htm>
- Chattin-McNichols, J. P. (1981). The effects of Montessori school experience. *Young Children*, 36(5), 49–66.
- Ruenzel, D. (1997). The Montessori method. *Education Week on the Web*. Available online at <http://www.amshq.org/links.html>

MOTIVATION

Motivation is the force behind behavior and provides an explanation for why people do things. Motivation influences what people do—meaning their choice of actions, as well as how they act; the intensity, persistence, and quality of their actions. Motivational theories help to explain people's achievements as well as their failure to achieve. They provide a way of understanding accomplishments and success, especially in the face of challenge and adversity. They also help to explain unexpected outcomes such as the lackluster performance of talented individuals or the triumph of an underdog who exceeds all expectations.

Motivation is especially prized in learning situations, whether the instruction takes place in a fourth grade classroom or on a soccer field. Without putting forth effort and actively engaging in the activity, even the most capable individuals will not benefit from the opportunity to learn. Motivation for learning is a particular kind of motivation that is concerned with the goals, activities, and behaviors involved in acquiring skills, knowledge, or competence (Brophy, 2004; Stipek, 2002). When students are motivated to learn, they put forth effort, they are engaged, they show greater persistence in the face of failure, and they take risks (attempting challenging tasks). As a result, they learn more, have deeper understandings of ideas, perform at higher levels of achievement, and are more likely to stay in school. Students who are motivated to learn also report greater satisfaction and enjoyment of learning, higher self-worth, and a greater sense of well-being.

An individual's motivation can vary depending on a number of factors including personal characteristics—age, ability, experience, values, and beliefs—and contextual characteristics—subject matter (gym versus math), task difficulty, task features (worksheet versus science project), task structure (individual, competitive, cooperative), teacher expectations, and the quality of the student–teacher relationship. Thus, a student may not have any interest in learning about history or physics, but may show initiative, effort, and persistence in studying art or literature. Rather than viewing people as being either motivated or not, most models of motivation view people as being differentially motivated to pursue some actions and not others. Individuals possess multiple motivations that at times compete for action (desire to watch that favorite television show and the desire to study for a science test). The key question for learning is how and why are students motivated to learn and achieve?

THEORETICAL APPROACHES TO MOTIVATION

Motivation is generally viewed as a multifaceted construct that has behavioral, cognitive, and affective dimensions. Different theoretical perspectives have variously focused on:

- Behaviors such as effort, engagement, persistence, and performance
- Thoughts such as expectations, self-perceptions, and goals
- Emotions such as pride, shame, and guilt

Motivation for learning is evidenced by the academic goals that students set, the quality of their engagement in tasks, their choices in courses (e.g., calculus or tennis), their persistence in the face of failure or challenges, their performance on learning activities, and the pride with which they experience their accomplishments. Thus, motivation for learning is not viewed simply as a unitary characteristic, of which people have more or less, but as a multidimensional construct. Most approaches fall under one of the following theoretical perspectives: behavioral, intrinsic motivation, or cognitive.

Behavioral

The dominant approach to motivating learning, especially in schools, has been the behavioral model, which involves the use of rewards and incentives to elicit desired behaviors. The use of external reinforcement is commonplace in schools and may take the form of tickets doled out for good citizenship, candy dispensed for turning in homework, or extended recess awarded for paying attention during an assembly. According to this model, behavior is controlled by its consequences. Thus, students are more likely to engage in learning behaviors that result in rewards and avoid behaviors that lead to punishment or undesirable outcomes. When students engage in learning activities to obtain rewards outside of the task, this type of motivation is referred to as extrinsic motivation. For example, when students study state capitals to obtain a sweet or learn multiplication tables to earn the chance to watch a video, the motivation is viewed as being extrinsic, or external, to the activity. The use of material or social incentives can be powerful in producing the motivation to engage in learning activities. The use of rewards for engaging in learning behaviors is popular because it is relatively easy to implement, targets specific behaviors, and its effectiveness can be easily monitored. There is disagreement in the field, however, over whether and under what conditions the use of rewards may undermine students' intrinsic motivation (Cameron & Pierce, 1994; Deci & colleagues, 2001). Critics of the use of rewards for learning are concerned that students' interest in a topic becomes replaced solely by an interest in the reward.

Intrinsic Motivation

There are many occasions, however, when students engage in learning activities without the promise of

rewards or the threat of punishment. They eagerly pursue interests in dinosaurs, pyramids, or tornadoes, for example. When people engage in activities for their sheer enjoyment, the motivation is considered to be intrinsic. Intrinsic motivation can be a powerful motivator because engaging in an activity doesn't depend on the existence of external reinforcers to make it worthwhile; simply doing the activity is inherently valuable and satisfying.

An intrinsic motivation approach assumes that people have a natural tendency to seek experiences that increase their competence, elicit curiosity, and promote autonomy. Learning activities that are optimally challenging (not trivially easy or too difficult), are novel and interesting, and offer choice and self-direction, tap into intrinsic motivation, and provide the opportunity for individuals to increase mastery, satisfy their curiosity, and enhance their sense of personal control.

One way of portraying the subjective experience of being intrinsically motivated is with the concept of flow (Csikszentmihalyi, 1997). The flow state is characterized by being so fully immersed in an activity that people lose track of time and become unaware of what is going on around them. Their attention is riveted and sharply focused, and there is a striking lack of self-consciousness. While observed in recreational activities such as chess, basketball, and painting, flow has also characterized the work of writers, inventors, and musicians. Among children, flow is most commonly seen at play, particularly with videogames, but may also be seen in learning activities such as reading, solving mathematical problems, or writing in a journal. Flow is not easily achieved in situations where there is little control over one's learning and the actions needed to perform the task such as those commonly found in schools.

Cognitive

Cognitive approaches view people's thoughts and beliefs as playing a central role in motivation and learning. According to this view, people's perceptions indirectly affect achievement by influencing how they think, feel, and act in learning situations. How people interpret and understand events is considered more important than what actually happens. People are viewed as acting on their understandings, however accurate or inaccurate, and these serve as powerful determinants of learning behaviors. For example,

students who selectively focus on the difficulty of tasks and their low performances in school may begin to see studying as futile and give up trying when presented with tasks that are within their ability to achieve. A variety of people's beliefs and thoughts play a critical role in how they interpret, engage, and perform in learning situations. These beliefs change with age, becoming more accurate, complex, and stable.

Specific types of thoughts and beliefs that are related to motivation and learning include an individual's self-perceptions of competence, self-efficacy beliefs, causal attributions, and achievement goals. Self-perceptions of competence refer to people's estimates of their ability. These perceptions influence a student's choice of tasks, effort, persistence, causal attributions, and achievement. Young children tend to overestimate their abilities and, accordingly, often maintain high expectations for future success even in the face of failure. As children develop, their perceptions of competence decline, but become more accurate. Self-efficacy is the belief that one is capable of performing in specific areas such as language arts, biology, or gym. Self-efficacy beliefs are task- or situation-specific and include the belief that one's actions can lead to desired outcomes (Bandura, 1997).

Causal attributions are beliefs about why things happen. When people succeed or fail in learning situations, they are assumed to naturally search for reasons for these outcomes (Weiner, 1992). For example, when students who diligently studied for an exam do poorly, they may attribute this result to external reasons, such as a difficult test, or to internal reasons, such as lack of ability. Depending on whether the explanation is internal or external to the individual (e.g., ability versus ineffective teacher), stable or unstable (e.g., ability versus effort), and controllable or uncontrollable (e.g., study strategies or difficulty of the exam), this increases or decreases their expectation for future success. Causal beliefs for success that are stable and internal lead to stronger expectations for future success. Failure attributions that are stable and internal lead to weaker expectations for future success. Thus, believing that one excelled in a biology class because of one's ability would result in a stronger expectation to succeed in the future than attributing it to an easy topic. In the case of failure, believing that it was caused by ability would decrease the expectation for future success more than attributing it to lack of studying. When causal attributions are made to unstable causes, future expectations are not

strengthened. Thus, attributing success to a good teacher or an easy exam is not likely to lead to greater expectations for future success.

Achievement goals refer to people's reasons for engaging in achievement-related behaviors (Ames, 1992; Dweck, 1999). Two main types of goals that have been identified are learning (or mastery) goals and performance goals. Students with mastery goals are concerned with developing new skills and increasing their competence. Students with performance goals are concerned with obtaining recognition of their competence. Two subtypes of performance goals have been further distinguished. First, performance-approach goals are focused on demonstrating competence. For students with this self-enhancement goal, the primary purpose of achievement activities is to obtain positive evaluations of their ability. Students with this goal are also likely to put forth effort on learning tasks, but choose tasks that are less challenging. They take few risks, such as answering questions only when they are certain that they are correct. Second, performance-avoidance goals are focused on avoiding negative judgments of ability. Individuals with these self-defeating goals are likely to engage in failure avoiding tactics such as choosing trivially easy tasks, putting forth minimal effort, or procrastinating.

CONTEXTS OF MOTIVATION

It is important to put each of these approaches in context and to recognize that motivation to learn doesn't develop independently of particular learning situations. Whether one uses a behavioral, intrinsic, or cognitive theoretical perspective to explain motivation, the nature of learning contexts also influences students' motivation. Contextual characteristics such as teacher instructional practices, beliefs, and relationships can cultivate or undermine students' motivation. For example, teachers who support the autonomy of students by providing choices in the classroom rather than being unilaterally directive and controlling have students who have higher levels of intrinsic motivation.

The social features of the context also play a crucial role in fostering motivation. Students who experience a sense of belongingness, who feel connected and a part of a community, are more likely to be motivated in school (Osterman, 2000). When students experience a sense of relatedness with peers and/or teachers, they are more likely to be engaged and invested in learning at school. Instructional practices, teacher control

orientations, school and class size, grouping structures, scheduling practices, and school norms and policies can foster belongingness or fuel alienation.

SCHOOL PSYCHOLOGISTS' ROLES

One of the primary roles of school psychologists is to help determine whether a disability that affects learning is present among students having difficulty in school. The identification of a disability may explain why a student is struggling in school, and appropriate interventions may be provided to accommodate or remediate the impairment. Students, however, often fail to perform in school even in the absence of a disability. School psychologists can help to differentiate between students who have a genuine disability that interferes with learning and students who are capable of achieving but are not performing at expected levels. To reliably ascertain whether a student has a learning disability, for instance, it is essential to determine: Is the lowered performance primarily caused by an inability to fully process sensory input or it is caused by a lack of interest, lack of effort, or, in other words, diminished motivation. It is not unusual for students with disabilities that affect learning to also exhibit reduced motivation given their history of academic difficulties. Thus, it is important to assess students' motivational characteristics in addition to their academic and cognitive functioning. Students who display motivation to learn are more likely to have higher levels of engagement, experience flow, have higher expectations, be more optimistic about their future performance, persist, in the face of failure, take risks, and achieve at higher levels. School psychologists can assess the motivational characteristics of students and develop interventions involving teachers, parents, peers, and individual students to promote the development of optimal motivation.

Assessment of Motivation

Recognizing that motivation is multifaceted and that people can be motivated in a variety of ways implies that motivation should be assessed in multiple ways and in specific learning situations. Accurate descriptions of motivation are obtained by assessing motivation:

- In specific subject matter areas
- In relation to the instructional context

- In specific contexts (e.g. home versus school, formal versus informal)
- With multiple data sources (e.g., self-reports, teacher reports, parent reports)

School psychologists assess motivation with multiple measures including observations, interviews, review of work samples, self-report measures, and rating scales. They can obtain valuable information by simply observing a student's behavior in a classroom. A common focus of observation is a student's engagement in learning activities. This may be measured by observing and recording the participation rates of students, time on task, work completion, persistence, and the quality of work samples. Interviews with students can provide valuable information about their learning behaviors, enjoyment of learning activities, and their motivational beliefs. These conversations can also inform the development of interventions by identifying potential reinforcers, areas of personal interest, and interpretations of their achievement outcomes.

Individuals involved in students' learning may be asked to complete rating scales that assess behaviors and attitudes related to motivation. Examples of published and research tools that assess motivational processes include the Academic Competence Evaluation Scales (DiPerna & Elliott, 2000), Children's Academic Intrinsic Motivation Inventory (Gottfried, 1986), and the Patterns of Adaptive Learning Scales (Midgley & colleagues, 1998).

Motivational Interventions

School psychologists use the results of assessments to design interventions that promote motivation for learning. The most commonly used method to increase motivation in schools is providing incentives for desired learning behaviors. From preschool onward, parents as well as teachers bestow rewards on students who are good citizens, name the capitols of the 50 states, sit quietly, and read every day. They receive material reinforcers such as candy, erasers, pencils, or stickers, as well as rewards that include extended recess, time on the computer, an opportunity to watch a video, school- or classwide recognition, or special privileges (e.g., line leader). The provision of rewards works best when the desired behavior is specifically defined and substantively related to the reward (e.g., a book rather than a candy bar for reading). It also is more effective when the reward is tied

to a specific standard of performance and not merely to the presence or absence of the behavior. For example, tying rewards to completing 20 math problems with 90% accuracy is more effective than setting goals of simply completing the math problems. Designing the reinforcement to be contingent on the quality of the performance is essential for keeping the focus on learning.

Rewards are especially effective in the short run to change behavior, but less effective in changing behavior over the long term. Eventually, rewards need to be phased out and replaced by an internal sense of motivation that doesn't rely on the continued receipt of external rewards. Intrinsic motivation approaches have the goal of increasing the satisfaction and enjoyment that individuals derive from an activity. Students read a book, invent a new form of transportation, or write a short story, not to receive a concrete reward or to avoid punishment, but because of the satisfaction they derive from the activity. Strategies that increase intrinsic motivation include selecting tasks that have intermediate levels of challenge or difficulty, designing activities that are interesting and novel, and providing choices in learning that increase students' sense of personal agency. For example, designing instructional activities that enhance the learning experience by creating situational interest, can lead to the development of personal interest in a topic. Teachers who communicate feedback in an informational rather than a controlling manner facilitate autonomy and self-regulation in students.

Cognitive interventions focus on changing the beliefs of individuals to promote adaptive responses to achievement situations. Interventions that foster perceptions of competence, self-efficacy, mastery and learning goals, and adaptive causal attributions can increase students' efforts and engagement in learning activities. Classroom learning structures can also affect motivational beliefs and learning. Competition can promote social comparisons and heighten awareness about performance evaluations, turning attention away from learning and the task at hand. Cooperative and individual learning structures are more effective in fostering learning and mastery goals. The development of learning communities that enhance a sense of belonging can promote students' motivation by creating supportive environments that enable students to take risks, to put forth effort, and to engage in learning.

School psychologists also deal with motivational problems that most children commonly experience

throughout the course of schooling. These may take the form of test anxiety, perfectionism, or boredom with school activities. These problems often involve performance goals, unrealistically high expectations, and low task value, respectively. School psychologists can help with these ordinary motivational problems by developing interventions that reduce anxiety, focus attention on the task instead of on performance evaluations, foster realistic expectations, and increase task value by highlighting the instrumental value of school activities.

—Evelyn R. Oka

See also Ability Grouping; Behavior Intervention; Cooperative Learning; Dropouts; Homework; Learning; Self-Management

REFERENCES AND FURTHER READING

- Ames, C. A. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261–271.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Brophy, J. (2004). *Motivating students to learn* (2nd ed.). Mahwah, NJ: Erlbaum.
- Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research, 64*, 363–423.
- Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York: Harper & Row.
- Deci, E. L., Koestner, R., & Ryan, R. M. (2001). Extrinsic rewards and intrinsic motivation in education: Reconsidered once again. *Review of Educational Research, 71*, 1–28.
- DiPerna, J. C., & Elliott, S. N. (2000). *Academic Competence Evaluation Scales*. San Antonio, TX: The Psychological Corporation.
- Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology, 53*, 109–132.
- Gottfried, A. E. (1986). *Children's academic intrinsic motivation inventory*. Odessa, FL: Psychological Assessment Resources.
- Midgley, C., Maehr, M. L., Hrduda, L. Z., Anderman, E., Anderman, L., Freeman, K. E., et al. (1998). *Manual for the patterns of adaptive learning scales (PALS)*. Ann Arbor: University of Michigan.
- Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research, 70*(3), 323–367.
- Stipek, D. (2002). *Motivation to learn* (4th ed.). Boston: Allyn & Bacon.
- Weiner, B. (1992). *Human motivation: Metaphors, theories, and research*. Thousand Oaks, CA: Sage.

MOTOR ASSESSMENT

Motor skills are generally evaluated during an assessment in the schools by an occupational and/or physical therapist. Motor performance is also considered an important part of a neuropsychological evaluation. A neuropsychological evaluation assesses the relationship between brain activity and behavior (Teeter & Semrud-Clikeman, 1997). There are occasions when a school psychologist may need to provide additional measures of motor skills to provide support for a child or adolescent in the area of handwriting and copying.

Motor skills can be divided into several areas. The most obvious division is between fine and gross motor skills. Gross motor skills are the bigger movements (e.g., running and jumping) that use the large muscles in the arms, legs, torso, and feet; whereas fine motor skills are small movements (e.g., grabbing something with the thumb and forefinger) that use the small muscles of the fingers, toes, wrists, lips, and tongue. In order to more fully understand these measures, it is important to first review the structures that contribute to motor functioning.

NEUROANATOMY

The motor system is contained within the front part of the brain. This motor strip controls the execution and maintenance of simple motor functions. It is a crossed system so that the right hemisphere motor strip located on the right side of the brain controls the left side of the body, and vice versa. The premotor cortex lies in front of the motor strip and directs the primary motor cortex.

In addition to the frontal lobes, the parietal lobe is also involved with the motor system. The parietal lobe lies in the superior portion of the back of the brain. This section allows for not only the perception of touch and temperature, but also an awareness of the position and movement of body parts (kinesthetic sense). Similar to the motor system, the sensory system is also a crossed system. It is particularly important for motor skills in that the primary parietal region allows for a rapid cross-communication with the motor system, which is necessary for the execution of motor behavior (Teeter & Semrud-Clikeman, 1997).

In addition to the sensory and motor cortices, the ability to integrate motor skills and visual information

is an important part of motor control. The juncture of the occipital, parietal, and temporal lobes has been implicated in visual–motor integration. This juncture lies in the posterior portion of the brain where the three lobes connect. For some children, fine motor skills may be intact but they experience difficulty integrating what they see with what their hands/fingers are reproducing. These children may have difficulties in visual–motor integration, but have adequate fine motor skills. Similarly, a child with fine motor skill deficits may experience difficulties with visual–motor tasks that are not caused by perceptual deficits. Fine motor skills are those that allow a person to complete a task with his or her hand, while perceptual skills are those that allow understanding of what the person sees.

The school psychologist needs to tease apart the difficulties a child may have through the use of fine motor tests as well as perceptual tasks that are not heavily involved motorically. For example, child with cerebral palsy may perform poorly on a visual–motor task because of obvious motor problems and should be tested for perceptual accuracy on tasks that do not have a motor component. Similarly children with tremors, arthritis, or motor slowing may do poorly on measures of visual–motor integration for these reasons and not because of perceptual difficulties. In addition, children with motor difficulties may do poorly because of their positioning. It is very helpful to have a physical therapist or occupational therapist assist the psychologist in positioning the child for optimum performance.

EVALUATION OF GROSS MOTOR SKILLS

The evaluation of gross motor skills is completed generally by a physical therapist and/or adaptive physical education teacher. Most school psychologists do not evaluate gross motor ability. However, it is important to be aware of qualitative differences in the child's ability to walk, his or her gait, and the fluidity of movement. A child who runs awkwardly, falls frequently, or walks on his or her tiptoes needs to be referred for an evaluation by a specialist in this area.

For younger children, evaluation of motor skills is an important aspect of the evaluation. The Bayley Scales of Infant Development, Mullen Scales of Early Learning, and the Denver Developmental Screening Test include measures of gross motor skills. In addition, the Vineland Adaptive Behavior Scales provides an evaluation of the child's fine and gross motor skills.

Treatment for gross motor skills deficits is generally completed by a physical therapist for children with severe deficits and may be accommodated by an adaptive physical education class for those with moderate to severe difficulty. For children with significant motor impairment, it is often a good idea for a neurologist to evaluate the child to determine whether a more significant problem is contributing to the child's difficulty. Often the first sign of a brain tumor or other neurological deficit is a decline in motor performance. For children who are developmentally delayed, the motor system is a good marker for the integrity of their neurological development. Thus, young children whose development is questionable should have an evaluation of their motor skills.

EVALUATION OF FINE MOTOR SKILLS

Tests of motor performance are a vital part of most neuropsychological assessments because of the observed connection of motor impairment to functional outcomes. Children who have difficulty completing tasks that involve buttoning, drawing, or tracing often have brain functions that are compromised. This difficulty often translates into difficulty adapting to one's environment and functioning independently.

Tests of fine motor skills are not often used by school psychologists but with training can be helpful in determining the extent of a child's motor deficits. Specific measures used for assessing the various aspects of fine and gross motor ability include handedness preference, strength, speed, and dexterity. Although performance with the preferred hand is usually slightly superior to that with the nonpreferred hand on tasks of fine motor ability, equal performance or better performance with the nonpreferred hand occurs frequently in the normal population. Therefore, neurological impairment cannot be surmised from a lack of laterality unless this pattern is observed across several tasks. Laterality refers to the preference most of us have for one side of the body or the other. For example, most people are right-handed, right-eyed, and right-legged—that is, they prefer to do activities with their right side. Impaired motor performance or lateralized deficits on a variety of motor tasks is quite rare in the normal population and may be more suggestive of a neurological disturbance in the contralateral hemisphere, because motor skills are controlled by the opposite side of the brain. Poor attention, lack

of effort, and lower cognitive functioning are also typical explanations for poor performance on motor measures.

Finger dexterity is an area of fine motor evaluation that should be included in many neuropsychological and school psychological evaluations. Measures include the Purdue Pegboard and the Grooved Pegboard. These measures are easily used by a school psychologist and norms are available. The Purdue Pegboard is a timed measure of motor speed and finger and hand dexterity. It involves the child placing pins in one of two rows of holes, using each hand separately and then together. Scores are obtained for each hand and for both hands. It is expected that the dominant hand will perform better than the nondominant and that both hands together will perform the best.

The Grooved Pegboard is a timed measure of motor speed where a child is asked to place keyhole-shaped pegs into holes in a four-inch square pegboard, using only one hand at a time. For the dominant hand, the time is expected to be faster than for the nondominant hand. One can also qualitatively evaluate the method that the child uses to complete the pegboard.

In addition to these measures, there are sensorimotor and visual-spatial scales on the NEPSY. These scales evaluate a child's ability to touch each finger sequentially with his or her thumb, imitate hand positions, and complete a maze as quickly as possible. In addition, the child is asked to copy figures that become increasingly more difficult and to judge where an arrow will hit a target.

Measures of visual-motor integration include the Bender-Gestalt Test and the Test of Visual-Motor Integration (VMI). These tests require a participant to copy geometric designs in clearly delineated squares of space equal to the original. The 24 designs increase in complexity, starting with a vertical line and progressing to three-dimensional figures. In addition to the VMI and Bender, the Developmental Test of Visual Perception-2 can be very helpful in evaluating eye-hand coordination, copying, spatial relations, visual closure, and visual-motor speed (how fast the child is able to complete a task). This measure also allows a comparison of subtests that are not as involved motorically from those that are motor driven. This difference is important for determining whether poor performance is caused by a motor difficulty alone or whether there are perceptual problems that are interfering with performance. If there are both perceptual and motor difficulties, intervention is more

difficult and the prognosis would be more guarded than motor problems alone.

Treatment for fine motor skill deficits for those children with severe difficulty often involves an occupational therapist. An occupational therapist assists the child in learning activities of daily living such as buttoning, zipping, and tying shoes. In addition, support is frequently given for copying figures through the use of tracing as well as dot-to-dot figures. Moreover, an occupational therapist also provides support to the classroom teacher and parent with a program to continue the work past the therapy hour (in the classroom or at home). The occupational therapist may see the child 15 to 45 minutes per week, and a supportive program can only assist the child in making good progress. The treatment is generally age-based with more hands on activities planned for younger children and more handwriting and copying activities for older children.

In summary, fine and gross motor skills can affect a child's learning ability as well as his or her ability to socialize. Children with significant gross motor skills have difficulty participating in group activities such as soccer or Little League, mainstays of many young children's social experiences. These difficulties can cause these children not to feel part of their peer group and to become less socially adept. In addition, children with significant fine motor delays may have difficulty with dressing and caring for their own needs. Adaptation needs to be encouraged. The use of Velcro fasteners are very helpful for many of these children.

The school psychologist may supplement his or her testing with testing by an occupational or physical therapist to complete an Individualized Education Plan (IEP) appropriately. The IEP is an individualized plan to assist the child with special education needs. Related services such as occupational and physical therapy are included in the IEP. In some cases the school psychologist will be called upon to interpret neuropsychological and neurological reports and needs to be conversant in what the tests measure and what the results mean. In other instances, the school psychologist may provide the only measures of visual-motor and/or fine motor skills, and these findings can be incorporated into an appropriate intervention program.

—Margaret Semrud-Clikeman and Jenifer Walkowiak

See also Sensorimotor Stage of Development

REFERENCES AND FURTHER READING

Teeter, P. A., & Semrud-Clikeman, M. (1997). *Child neuropsychology*. Boston: Allyn & Bacon.

MOVIES. See MEDIA AND CHILDREN

MULTICULTURAL EDUCATION

Much has changed since multicultural education first became a “hot topic” for researchers, educators, and parents. What we know today about multicultural education is very different from what we knew in the past. The United States, as well as many other countries, has evolved into a country rich with diversity among its people, their cultures, and their backgrounds. Students in today’s schools come from homes of different economic, linguistic, religious, and ethnic traditions. The National Center for Educational Statistics reported that in 2000 39% of the students in U.S. schools were considered part of a minority group, and in many parts of the country the percentages were much higher. Conditions of poverty, community violence and crime, societal and individual prejudice, and racism continue to create additional challenges for students trying to learn. While the diversity of the U.S. school population is growing, many students from these backgrounds are being left behind academically. In addition, the reliance on high-stakes tests, such as state standards tests, widens the gaps in academic achievement for diverse groups. This is one of the key reasons that applying multicultural education in schools is so important.

Multicultural educators and researchers have long debated the definitions, meanings, goals and approaches of multicultural education. Banks and Banks (2001) and Sleeter and Grant (1999) have written much about multicultural education. The works of these authors are described here because they offer useful definitions, descriptions of different understandings and approaches, and discussion of their relative strengths and shortcomings as the approaches are used in schools.

Banks and Banks (2001), two of the leading figures in the field of multicultural education, propose that multicultural education is at least three things: an idea or concept, an educational reform movement, and a

process. They say that multicultural education incorporates the belief that all students, regardless of gender, social class, ethnicity, or culture, should have an equal opportunity to learn. Korn and Bursztyn (2002) add that multicultural education is a way to fill the gap between the cultures of home and school with multicultural curricula. Sleeter and Grant (1999) use the term *multicultural education* to encompass educational practices directed toward issues of race, culture, language, social class, gender, disability, racism, classism, and sexism.

Much like the definition of multicultural education, there is a debate about its goal(s). The consensus among most scholars and researchers appears to be that the major goal of multicultural education is to address the inequality in education by promoting an understanding and appreciation of cultural diversity (Davidman & Davidman, 1994).

CONTRIBUTIONS OF BANKS AND BANKS

Banks (1994) states that there is general agreement among most multicultural education scholars and researchers that institutional changes must be made for multicultural education to be implemented successfully (e.g., changes in curricula, teaching materials, learning styles, attitudes, and school culture). He articulates five dimensions of multicultural education (see Table 1) that describe the different ways to accomplish the goal of multicultural education.

Of Banks’ five dimensions of multicultural education, *content integration* is the most common approach used in schools today. Table 2 shows examples of each approach of content integration, along with the advantages and disadvantages of each approach. The *contributions approach*, the most widely used in schools, is easy to integrate without changing the structure and goals of the mainstream curriculum, and knowledge can be spread quickly (Banks & Banks, 2001). Numerous disadvantages outweigh the advantages of this approach. A major disadvantage is that curriculum remains unchanged or unaltered, thus it leads to only telling “half of the story.” Content is limited to special months and holidays without regard for important concepts and issues related to oppression and struggles of diverse groups. Students may end up studying the strange and exotic characteristics of diverse cultures, which may reinforce stereotypes and misconceptions (Banks & Banks, 2001). For example, heroes and heroines who are more radical and less conforming, such as Malcolm

Table 1 Five Dimensions and Definitions of Multicultural Education

<i>Dimension</i>	<i>Definition</i>
Content integration	The extent to which teachers use examples as content from a variety of cultures in their teaching
Knowledge construction	The extent to which teachers help students process, understand, investigate, and determine how biases within a discipline influence the ways in which knowledge is constructed
Prejudice reduction	Focus on the characteristics of students' racial attitudes and how to modify these attributes by teaching methods and materials
Equity pedagogy	The modification in teaching that facilitates academic achievement of students from diverse racial, cultural, gender, and social-class groups
Empowering school culture and social structure	The examination of grouping and labeling practices, sports participation, unequal achievement, and the interaction of staff and students across ethnic and racial lines to create school culture that empowers students from diverse racial, ethnic, and gender groups

X and The Black Panthers, are often overlooked and therefore “invisible” in this stage of integration.

Teachers may find the *additive approach* attractive. It allows them to “add” ethnic content without putting a considerable amount of time and effort into restructuring the curriculum, which Banks and Banks (2001) suggest would take substantial training and rethinking of the curriculum and its purpose, nature, and goals. However, adding a book or unit that lacks genuine ethnic content, concepts, and experiences is problematic; it continues to perpetuate only a mainstream viewpoint rather than the perspectives of the ethnic cultures that participate and are affected by these events and issues.

The change in curriculum and pedagogy in the *transformation approach* distinguishes it from the aforementioned approaches. Korn and Bursztyn (2002) describe this approach as more comprehensive and radical because it changes the curriculum to encourage student empowerment and social action. They note that transformation goes beyond the study of heroes, holidays, and people. It considers the practices that are part of understanding the children's experiences. This approach has three strengths:

1. It builds students' knowledge and awareness of the ways in which culturally and linguistically diverse groups have contributed to and participated in the formation of U.S. society and culture.
2. It assists in the reduction of stereotypical views, stigmas, and misconceptions.

3. Students from diverse cultural groups can identify with the school curriculum when they are able to see their cultures being represented in the curriculum.

This involves a significant amount of time and effort to train teachers. Both the curriculum and the teacher are transformed. Teachers engage in a continual and ongoing process of self-awareness and curriculum change.

The *social action approach* is comprised of all the components of the transformation approach, plus components that call for students to take action and make decisions that are related to the issues, concepts, or problems that they study. The social action approach enables students to improve skills in decision making, social action, data gathering, and group interaction (Banks & Banks, 2001). It also develops their ability to analyze their values and the values of others. The social action approach takes a considerable amount of time to plan and teach (Banks & Banks, 2001). Educators using this approach are encouraged to help students focus on considering and taking action, rather than being preoccupied with problems.

CONTRIBUTIONS OF SLEETER AND GRANT

Sleeter and Grant (1987, 1999) argue that much of the existing literature addresses only limited aspects of multicultural education. Recognizing that

340 Multicultural Education

Table 2 Four Approaches to Content Integration

<i>Approach Name</i>	<i>Description</i>	<i>Examples</i>
Contributions	Primary focus on ethnic heroes, holidays, cultural elements (e.g., food, dances, and music) and artifacts with little attention to other aspects of ethnic content.	(a) Celebrations of the accomplishments and contributions of African Americans and Black History in February, or (b) the study of Native American culture during the Thanksgiving holiday.
Additive	The addition of content, concepts, themes, and perspectives to the curriculum without change in the basic structure, purpose and characteristics of the curriculum.	(a) A teacher requires students to read <i>The Joy Luck Club</i> (1994), a best selling novel that depicts the complexities of the relationship between Chinese immigrant mothers and their American-raised daughters or, (b) The addition of a unit on African Americans in education during the study of U.S. history and segregation.
Transformation	Transforms the curriculum and enables students to view concepts, issues, themes, and problems from several perspectives and points of view. Often a major shift in the way teachers teach, understand, and connect with students (Korn & Burszty, 2002).	A teacher redesigns her literacy curriculum and methods of instruction to include more group projects based on the students' home cultures, resulting in a very different way of teaching.
Social Action	All components of the transformation approach, plus it calls for students to take action and make decisions related to the issues, concepts, or problems they study. Students gather data, analyze their values and beliefs, expand their knowledge, identify alternative courses of action, and decide what, if any, actions they will take.	(a) A class studies prejudice and discrimination in their school and decides to take action to improve race relations in the school (Banks & Banks, 2001). (b) A teacher designs an English unit and requires students to complete a social action project on the under-representation of individuals with disabilities in television and film. The students gather data on the number of individuals with versus the number without disabilities in television and film, analyze the differences, and write a letter to filmmakers and producers of television programs suggesting ways to improve the visibility of individuals with disabilities in film and TV.

From Banks, J. A., & Banks, C. A. M. (Eds.). (2001). *Multicultural education: Issues and perspectives* (4th ed.). New York: John Wiley.

“multicultural education means different things to different people” (Sleeter & Grant, 1987, pp. 31–32), they reviewed and examined a wide variety of literature from various educators and researchers on this topic. They developed a taxonomy or classification system to help define multicultural education, examine its use, and identify shortcomings of the approaches. Five categories of multicultural education emerged as a result of their examination:

1. Teaching the culturally different
2. Single group studies
3. Human relations
4. Multicultural education
5. Education that is multicultural and social reconstructionist

Table 3 Five Approaches to Multicultural Education

<i>Description of Approach</i>	<i>Critique</i>
Teaching the Culturally Different: Views multicultural education as something one does mainly with students who are of color. Main goals are: (a) helping educators teach students from diverse backgrounds, and (b) making a commitment to educational achievement of children of color and development of positive group identity.	Materials discuss race and ethnicity; limited attention is given to other forms of diversity such as language, sexual orientation, religion, and gender. Limited progress has been reported in recommendations for practice, goals, and suggestions for instruction. This approach puts too much responsibility for eliminating racism on people of color and their teachers rather than on the general mainstream population.
Human Relations: Views multicultural education as a means to help students of different backgrounds communicate, get along better, and feel good about themselves.	The approach lacks long-term goals; it ignores the impact that institutional discrimination, powerlessness, poverty, and privilege can have on communication and appreciation for one another.
Single Group Studies: Uses lessons or units that focus on the experiences and cultures of specific groups such as a particular ethnic group (e.g., African American, Native American, Asian, or Filipino). Can focus on developing acceptance, appreciation, and empathy for America's rich cultural and linguistic diversity (King, 1980), or on reflective decision making used for resolving personal problems (Banks, 1973).	The goals of this approach are sometimes unclear and authors of single group studies admit to having different goals. This approach emphasizes teaching about the contributions of ethnic groups without raising awareness of racial oppression or activating social action. Also, this approach lacks attention to other forms of human diversity; the case of "single" versus "multiple."
Multicultural Education: Designed to promote: (a) strength and value of cultural diversity, (b) human rights and respect for cultural diversity, (c) alternative life choices for people, (d) social justice and equal opportunity for all people, and (e) equity in distribution of power among members of all ethnic groups (Gollnick, 1980; Gollnick & Chinn, 1998).	This approach has well-developed goals and includes promising models of curriculum, instruction, and teaching guides. Although this approach is the most popular of the five approaches, it needs improvement in at least two areas. Authors should: (a) give equal weight to both curriculum and instruction, and have more discussion on policy, language, and bilingualism from a multicultural perspective; and (b) consider the intersection of race, class, and gender factors when examining oppression.
Education that is Multicultural and Social Reconstructionist: Designed to promote cultural pluralism and to prepare people to take social action against social structural inequality. Goals expand beyond the multicultural education approach, with more emphasis on helping students gain a better understanding of the causes of oppression, inequality, and ways to resolve social problems. Understanding of concepts and issues and skills in social action are developed through it. Students engage in democratic decision making about substantive school-wide concerns.	This approach gained popularity in the schools during the 1990s. Unlike other approaches, this approach promotes learning to form coalitions across race, class, and gender lines. Forming coalitions is a complex skill important in a multicultural democratic society. A shortcoming of this approach is that it is relatively new, with few studies or examples available to guide people who want to implement experiences with a wide range of people, perspectives, and activities. Some think this approach is good but not feasible. Some criticize it because when students think for themselves and are empowered with skills in social action, they may challenge their teachers or school systems.

Sleeter, C. E., & Grant, C. A. (1999). *Making choices for multicultural education: Five approaches to race, class, and gender*. Upper Saddle River, NJ: Prentice Hall.

Table 3 summarizes the five categories and Sleeter and Grant's critique of each one. They believe that the fifth category offers the most promise for addressing

today's multicultural education needs. This approach involves teaching skills in social action and promoting the development of understandings that are constructed

out of one's experience with diverse perspectives and considerations. Students move from being thinkers to actors who can "work collaboratively to speak out, be heard, and effect change" (Sleeter & Grant, 1999, p. 221), thereby taking charge of their lives.

Whichever approach to multicultural education is used, it should include more than awareness of culture. "Multicultural education embodies a perspective rather than a curriculum" (Carr, 2002). Carr, Manager of the California Department of Education, Special Education Division, advocates that teachers need to use a multicultural education approach that supports and encourages greater appreciation, tolerance, and understanding of diverse cultural groups, learning styles, and curriculum. Students need to learn who they are in relation to the world and to their own environment. Multicultural education includes infusing a child's language and cultural knowledge throughout classroom routines and curriculum. It also includes culturally responsive teaching, which Gay (2002) defines as using characteristics, experiences, and perspectives of culturally diverse students as tools for effective teaching. As a result, teaching is consistent with students' experiences and holds personal meaning; each child is engaged and encouraged to learn and succeed. More importantly, multicultural education offers students of all backgrounds knowledge and skills in working with people representing a variety of backgrounds. Multicultural education offers the depth and tools to prepare students for productive actions and contributions in today's world.

—Tonika Duren Green and Colette L. Ingraham

See also Cross-Cultural Assessment; Race, Ethnicity, Class, and Gender; School Reform

REFERENCES AND FURTHER READING

- Banks, J. A. (1973). Teaching black studies for social change. In J. A. Banks (Ed.), *Teaching ethnic studies* (pp. 149–179). Washington, DC: National Council for the Social Studies.
- Banks, J. A. (1994). *Multicultural education: Theory and practice* (3rd ed.). Needham Heights, MA: Allyn & Bacon.
- Banks, J. A., & Banks, C. A. M. (Eds.). (2001). *Multicultural education: Issues and perspectives* (4th ed.). New York: John Wiley.
- Carr, B. (2002). Accepting the challenge. *The Special Edge*, 15(2), 1.
- Davidman, L., & Davidman, P. T. (1994). *Teaching with a multicultural perspective: A practical guide*. White Plains, NY: Longman.
- Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education*, 53(2), 106–116.
- Gollnick, D. M. (1980). Multicultural education. *Viewpoints in Teaching and Learning*, 56, 1–17.
- Gollnick, D. M., & Chinn, P. C. (1998). *Multicultural education in a pluralistic society* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- King, E. W. (1980). *Teaching ethnic awareness*. Santa Monica, CA: Goodyear.
- Korn, C., & Bursztyn, A. (Eds.). (2002). *Rethinking multicultural education: Case studies in cultural transition*. Westport, CT: Bergin & Garvey.
- Sleeter, C. E., & Grant, C. A. (1987). An analysis of multicultural education in the United States. *Harvard Educational Review*, 57, 421–444.
- Sleeter, C. E., & Grant, C. A. (1999). Making choices for multicultural education: Five approaches to race, class, and gender. Upper Saddle River, NJ: Prentice Hall.
- Tan, A. (1994). *The joy luck club*. New York: Prentice Hall.
- Mayer, D. P., Mullens, J. E., & Moore M. T. (2000). *Monitoring school quality: An indicators report* (NCES 2001–030). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Available online at <http://nces.ed.gov/pubs2001/2001030.pdf>
- Wirt, J., Choy, S., Gerald, D., Provasnik, S., Rooney, P., Watanabe, S., et al. (2002). *The condition of education 2002* (NCES 2002–025). Washington, DC: U.S. Government Printing Office. Available online at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002025>.

MULTIDISCIPLINARY TEAMS

Multidisciplinary teams (MDTs) are decision-making groups composed of individuals with expertise in differing knowledge and skill areas. MDTs are used in a variety of settings in the helping professions. In education, MDTs make decisions about whether a student will receive special education services and develop the student's Individualized Education Plan (IEP). Their use in the provision of special education services was first required in 1975 by the Education for All Handicapped Children Act (Public Law 94–142). The rationale for why these teams are multidisciplinary is that decisions in complex situations are best made with input from individuals with diverse perspectives. MDTs offer the school psychologist and others the opportunity for increased communication with those who have different professional specializations.

The term *multidisciplinary* means that the team is composed of individuals from different professions.

Other names used for MDTs include child study teams, IEP teams, appraisal teams, and placement committees. Knowing that a school team is multidisciplinary does not explain how the team members interact with one another. Collaboration, rather than a series of individual reports, is strongly recommended. Some models of team functioning involve minimizing the distinctions between professional roles, even to the extent that team members train other team members from different professions to perform some of their traditional job functions.

The Individuals With Disabilities Education Act 1997 (IDEA 1997) specifies the individuals who are to be involved in making special education decisions concerning eligibility, the IEP, and placement. Parents are to be participants in each of these decisions. After evaluation data have been collected from interviews, tests, observations, and school records, the law requires that a group of qualified professionals and the parents use the data to determine whether the student meets the legal definition of a child with a disability. The team that develops the child's IEP is to include the parents, regular education teacher, special education teacher, an individual who can interpret the implications of the evaluation data for the student's instruction (e.g., a school psychologist), and a school representative who knows about the general curriculum, specialized instruction, and available school resources. Some teams also include the student, counselor, social worker, nurse, speech-language pathologist, physical therapist, occupational therapist, and/or persons from outside agencies. Others, including the student, may participate on the IEP team under certain circumstances. Determination of the educational placement of a child with a disability is made by a group composed of the parents and others who are knowledgeable about the child. They consider the data from the comprehensive evaluation and placement options in making decisions on behalf of the child. The three decisions—eligibility, IEP, and placement—can be made by the same MDT, or a different one; the MDT can be any of the groups defined in IDEA as responsible for these decisions. It is the responsibility of the school district to make sure the correct individuals participate in each decision.

The student's regular education teacher knows which learning and behavior strategies have helped the student and what modifications and supplements to the general education program are needed. The special education teacher has expertise in the special

education methods that the student needs to succeed in school. Most students with disabilities receive their educational instruction from both regular and special education teachers. It is important that these key people in the implementation of the IEP be involved in its development.

The school psychologist likely gathered much of the evaluation data that the MDT used to determine whether the child met the legal requirements for eligibility for special education services, and can interpret the data as needed by other team members. At the IEP meeting, the school psychologist should explain the instructional implications of the evaluation data.

The principal acts as the representative of the school district to make sure that the instructional plans in the IEP can be implemented. This requires knowledge of the general education curriculum and the school district's resources, qualifications to supervise the provision of special education services, and authority to commit resources of the district to implement the IEP.

Parents are the experts on their own children and as such have valuable contributions to make in special education decisions. They have been with the child in many environments, not just the school; know the child's medical, educational, and social-emotional histories; and can explain the home environment. Of all the MDT members, it is the parents who will have the longest involvement in the student's life.

Students must be invited to participate on the MDT when transition needs and services are to be considered. Because transition service needs must be included in the IEP by the time the student is 14 years of age, adolescents with disabilities often participate on their own IEP teams. Parents may decide that it is appropriate for younger students to participate, but their inclusion on MDTs is much less frequent. Adolescents on MDTs have the opportunity to share their perspectives, needs, and goals with the adults who are providing their support and guidance. Their presence on the MDT enhances the team experience for parents and regular education teachers, and results in administrators focusing more on the student's strengths, interests, and needs (Martin & colleagues, 2004).

Other persons, like the school nurse or social worker, may participate on MDTs, particularly when their services are to be provided as part of the student's IEP. Someone representing the agency that is likely to provide the student's future transition services needs to be on the IEP team when the services



are discussed. In any individual situation, the parents or the school district might want to invite other persons to the meeting. For example, the physician who is managing a student's medications could explain their effects on the child's behavior and could learn from other MDT members how the medications may be affecting the child's school performance.

MDT members may contribute more in the meeting if the number of participants doesn't get too large. Parents are particularly likely to be intimidated in a situation in which a sensitive subject like their child's education is being discussed by individuals who may know each other but who are newly acquainted with the parents. In general, who is on the team affects the experience of other team members in terms of who talks more and what is talked about (Martin & colleagues, 2004).

Ideally, all MDT members participate as equal partners in decision making. Unfortunately, broad participation by diverse team members does not necessarily improve problem solving or outcomes for students (Fuchs & colleagues, 1996).

School psychologists are typically trained to facilitate groups in the problem-solving process. The use of effective communication skills and conflict-resolution strategies will move the group beyond the sharing of a series of reports to meaningful communication.

—Nancy A. McKellar

See also Diagnosis and Labeling; Individuals With Disabilities Education Act; Individualized Education Plan; Least Restrictive Environment; Special Education; Student Improvement Teams

REFERENCES AND FURTHER READING

- Fuchs, D., Fuchs, L. S., Harris, A. H., & Roberts, P. H. (1996). Bridging the research-to-practice gap with mainstream assistance teams: A cautionary tale. *School Psychology Quarterly, 11*, 244–266.
- Individuals With Disabilities Education Act Amendments of 1997, Public Law 105-17, 20 U.S.C. 1401, et seq.
- Martin, J. E., Marshall, L. H., & Sale, P. (2004). A 3-year study of middle, junior high, and high school IEP meetings. *Exceptional Children, 70*, 285–297.