

PAKISTAN, SPECIAL EDUCATION IN

Special education was established formally in 1972. Nine years later, in 1981, the federal government promulgated an ordinance, Disabled Persons (Employment and Rehabilitation) Ordinance, 1981. In 1985, the office of the Directorate General of Special Education was established as a division of the Department of the Ministry of Women's Development, Social Welfare, and Special Education. Innumerable governmental and nongovernmental organizations currently are providing special education services.

Pakistan is comprised of four provinces: Punjab, Sindh, North West Frontier Province, and Balochistan. Punjab has a population of 73,621,290, among whom 1,826,623 (2.4 percent) have disabilities. Among Sindh's population of 30,439,893, 929,400 (3 percent) have disabilities. Among the North West Frontier Province's population of 17,735,912, 375,448 (2.1 percent) have disabilities. Among Balochistan's population of 6,565,885, 146,421 (2.2 percent) have disabilities.

Thus, the total populations of persons with disabilities is 3,293,155, among whom 265,398 are visually impaired, 243,683 are hearing impaired, 625,785 are physically impaired, 210,854 are mentally handicapped (i.e., those who are totally dependent on others), 250,184 are mentally impaired (i.e., those who display greater independence), 270,451 have multiple disabilities, and 1,426,800 have other disabilities (e.g., autism, Down syndrome, and ADHD).

Among the total population of persons with disabilities living in urban (or rural) areas, 10.7 percent (and 12.2 percent) are between ages 0 and 4, 14 percent (and 15.3 percent) between 5 and 9, 10.7 percent (and 9.7 percent) between 10 and 14, 9.5 percent (and 7.8 percent) between 15 and 19, 8.4 percent (and 5.7 percent) between 20 and 24, 7 percent (and 5.7 percent) between 25 and 29, 6.2 percent (and 4.7 percent) between 30 and 34, 5.1 percent (and 3.7 percent) between 35 and 39, and 4.9 percent (and 3.9 percent) between 40 and 44 years.

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PALESTINIAN CHILDREN AND YOUTH IN THE GAZA STRIP, SPECIAL EDUCATION AND

Historical Context of the Gaza Strip

The Gaza Strip, a rectangular shaped parcel of land, hugs the southeastern corner of the Mediterranean Sea. It is approximately 25 miles long and 5 miles wide at its widest location. The landmass of Israel is approximately 8,000 square miles. The Occupied Territories comprise 2,400 square miles, of which the Gaza Strip comprises 136 square miles, or less than 1.3 percent of Israel and the Occupied Territories combined (Marsden, 1995). Its modern neighbors are Israel to the north and east and Egypt to the south. During the last 2,000 years Palestine and its people have been ruled by a succession of foreign powers: chronologically, the Romans, Turks, Byzantines, Crusaders, Turks, Ottomans, British, Egyptians, and most recently, Israelis. The Gaza Strip, Israel, the West Bank, and Jordan are modern-day remnants of the historic state of Palestine.

The British rule, starting in 1918 under a League of Nations mandate, ended when the 1948 War led to the creation of the state of Israel. This war forced thousands of Palestinians living in what is now Israel to flee north into Lebanon, east into Jordan, or south into Gaza. Their intent was to remain in these sanctuaries for a brief period of time (e.g., a week or two) and then return to their homes and land. Their fate was different. They were not allowed to return and instead became permanent refugees. Those who fled to Gaza were made to settle largely in eight camps. Refugees now constitute approximately 75 percent of the Palestinian population in the Gaza Strip.

The Gaza Strip and the West Bank emerged as residual territories separate from Israel. From 1948 to 1967 the Gaza Strip was held in trust by Egypt—a condition viewed

internationally as having a provisional character pending a political settlement in the area. Egyptian educational methods were implemented into the Gaza Strip.

In 1950, the United Nations created the United Nations Relief and Works Agency for Palestinian Refugees in the New East (UNRAW) to provide humanitarian assistance and social services together with educational services to displaced Palestinian refugees (Roberts, Joergensen, & Newman, 1984). Its regional headquarters is in Amman, Jordan.

In 1967, during the Six Day War, Israel advanced into and remained in the Gaza Strip. Israel destroyed more than 400 villages in the Occupied Territories to open the way for Jewish settlements, further increasing the refugee population. Israel interpreted this victory as justification to formally annex the Occupied Territories and reestablish a "Greater Israel" that closely followed Old Testament biblical boundaries. In contrast, the international community interpreted the role of Israel in these territories to be that of an occupying power, with all associated rights and duties (Roberts et al., 1984). In 1994, Israeli military occupation subsided, Yasser Arafat returned to the Gaza Strip and West Bank, and the Palestinian Authority began to establish governments and to rule. Political infighting and resulting political instability have occurred following Arafat's death.

The Social and Political Context for Education in the Gaza Strip

The population within the Gaza Strip is estimated to be approximately 1.2 million and growing. Gaza has one of the highest birthrates in the world, approximately 5 percent annually. Half of its population is under 15 (Human Resources and Social Policy, 1993). Overpopulation was exacerbated further by the return of expatriates.

Israel, as the occupying force in this region, feared educational activities could strengthen Palestinian nationalism and efforts to unify and thus posed a threat to its security. The first Intifada (i.e., uprising) served to strengthen these fears. Thus, Israel exerted control over education. It closed two universities in Gaza, banned the use of most textbooks (e.g., those with three of the four colors within the Palestinian flag) and censored others, banned the use of maps that made reference to Palestine (preferring to use the Biblical names of Judea and Samaria), closed schools frequently (e.g., thirty-six closures between September 1988 and January 1989) and often for months, prohibited schools from issuing educational materials parents could use at home during school closures, used roadblocks to monitor and disrupt the passage of children to school, detained students for alleged infractions without charge, arrested students prior to and released them after the final examinations (resulting in widespread cheating on final exams), restricted groups to no more than two when under curfew (conditions

that often extended for weeks), tear-gassed schools, making them inaccessible for weeks, stormed schools and damaged property, and beat students and teachers.

On occasion, these and other conditions elicited stone throwing by students on their way to school and disruptive behavior once in school. Conditions outside of the classroom, including students' physical survival, became more important than learning the three Rs. Military officials bulldozed all cinderblock fences surrounding schools because students used them as barriers between them and the military.

Education in the Gaza Strip

From 1967 until 2004, schools were subject to control by Israeli military authorities. Public schools have a 6-days-a-week, 9-months-a-year schedule, with no school on Friday, the Muslim Sabbath. Public preschool education and special education services for children with handicapping conditions were unavailable (see Abu Ghazaleh, Abu Ghazaleh, & Oakland, [1990] for a discussion of services provided to mentally disabled infants, children, and youth in the Gaza Strip. Also see Oakland [1997] for a discussion of efforts to address the needs of young children with mental retardation). Students enter school at age six. Nine years of schooling are compulsory. Students who elect to attend secondary school enter at age 15 and, until recently, had to pass the Egyptian-administered tawjihi exit examination to receive high school credit. An Egyptian curriculum was used throughout this region.

Two main educational systems prevail: local, government-administered schools, comprising 31 percent of the students, and U.N. Relief and Works Agency-administered schools for children from refugee families, comprising approximately 62 percent. Classrooms are overcrowded. The average class size is 40; some have 60 students. Classes typically are offered in double shifts, the first from 7 AM to 11 AM and the next from 11 AM to 3 PM. Gender segregation is longstanding (e.g., due to both religious conservatism and colonial heritage) and widely practiced within the 22 Arab countries, including Gaza. Fewer than 10 percent attend one of four private schools. They have a low teacher: pupil ratio (i.e., about 1:16) and employ the best-prepared teachers.

Local Government-Administered Schools

Educational facilities generally are lacking and substandard. No new schools were built during 1967 and 1977. The few that have been constructed have not kept pace with the region's burgeoning population of children. Few government-supported schools have libraries or science laboratories.

Teachers' educational backgrounds also generally are substandard. Teachers are not required to have teacher training. Most have a 2-year diploma from a community or teacher's college. Their salaries are low, generally less

than \$100 per month. The lack of adequate standards for becoming a teacher and their low salaries contribute to low prestige and associated lack of respect by students and their families. Most teachers are female. Males are most likely to teach math and science at the secondary level.

Until somewhat recently, families were required to pay for tuition and books. Many families were unable to pay these fees, given their severe economic problems. Unemployment rates for men typically exceed 40 percent. Women rarely work outside of their homes and thus do not contribute directly to the family's economic resources. In addition, in reference to girls, poor families must decide whether to use their limited resources for their education or for establishing a dowry. Marriage and preparation for it generally are thought to be more important than education for their future.

United Nations Relief and Works Agency-Administered Schools

The U.N. Relief and Works Agency is the largest provider of education in the Gaza Strip. Its 159 schools and support facilities generally are substandard. For example, there are more classes than classrooms. About one quarter of high schools have a science laboratory. The ability of this agency to educate refugee students has been attenuated by the large increase in children among Palestine refugee families, a 33 percent increase between 1987 and 1994. Its elementary schools have both mixed and gender-segregated classrooms. All secondary schools are segregated by gender.

Various differences existed between local government-administered and U.N. Relief and Works Agency-administered schools. The U.N. Relief and Works Agency controlled its own finances, administration, employment, and teacher preparation. Parents were not charged for tuition or books. Teachers and administrators came from refugee families. U.N. Relief and Works Agency teachers are paid about twice as much as their colleagues working in locally administered schools.

Education After the Intifada

The Declaration of Principles on Interim Self-Government Arrangements was signed by the Israeli and Palestinian Liberation Organization in Washington, DC, on September 13, 1993, establishing a pathway for Palestinian self-rule. Eight months later the Agreement on the Gaza Strip and Jericho Area (i.e., the Cairo Agreement) was signed. Israel withdrew its troops from the Occupied Territories in May 1994, allowing Palestinians to assume some degree of self-rule following 27 years of Israeli occupation.

The Palestinian Ministry of Education and Higher Education was established in September 1994. This Ministry, along with the Department of General and High Education, are working with the U.N. Relief and Works Agency and the local education authorities to increase the number of

schools, improve teacher quality (e.g., 12,000 teachers received in-service continuing education), and in other ways improve educational services. A locally developed curriculum, together with new textbooks, has replaced those from Egypt.

Special education services generally are unavailable in schools. Moreover, many families are reluctant to identify their children as displaying special education needs, in part due to a lack of services for them. The U.S. Agency for International Development-sponsored Sun Day Care Center, established in 1982, developed an elaborate and effective infrastructure for the provision of services to children with mental retardation and their families. Services to children with hearing and language disorders also were provided. The Sun Day Care Center closed in 1996, shortly after the institution of the new Arafat government.

Educational leaders face significant challenges due to financial and personnel shortages, continued Israeli military incursions, and lack of political stability and respect for government. The need for social and psychological changes among students may be more subtle yet no less real.

During the Intifada, teachers often were seen as being distant from and enemies of students. Teachers often feared student's undisciplined nature. The change from surviving in a society daily impacted by harsh military occupation to one that allows greater self-rule requires the need to make fundamental social and attitudinal changes. For example, principles of self-authority and self-discipline need to replace principles of self-protection and belligerence. Students must move from life under forms of anarchy to one of self-control and respect for education. The continued restrictions on movement of persons beyond the Gaza Strip by the Israelis serve to reinforce in Palestinians the long-held reality that education is less important than efforts that help ensure more basic needs are met.

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PALMAR CREASE

Human palms are covered by creases of different depths, lengths, and directions. The flexion creases are formed during early intrauterine life and are thought to be influenced by factors causing anomalies in the embryo. Variations in appearance of the palmar creases have been linked to certain medical disorders. Therefore, alterations have medical diagnostic value and usually are included in dermatoglyphic analysis. The three main creases have been the primary focus of most investigations. They are the radial longitudinal or thenar crease, the proximal transverse, and the distal transverse. Alter (1970) measured differences in the space between palmar creases, noted abnormalities, and described variations in a normal population.

A single crease across the palm of the hand frequently is described as characteristic of Down syndrome (Robinson & Robinson, 1965; Telford & Sawery, 1977). The proximal and distal transverse creases are replaced or joined into a single crease that transverses the entire palm. This has been referred to as a single palmar crease, single transverse fold, four finger line, or simian crease. The term simian crease, although frequently used, is not appropriate. The frequency of the single palmar crease ranges between 1 and 15 percent in controlled populations and possibly higher in groups with developmental defects (Schaumann & Alter, 1976). Researchers noted that the variability in appearance makes determination difficult and may partially account for the wide range in reported frequency.

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DOWN SYNDROME PHYSICAL ANOMALIES

PANDAS

See PEDIATRIC AUTOIMMUNE NEUROPSYCHIATRIC DISORDERS ASSOCIATED WITH STREPTOCOCCUS INFECTIONS.

PARAPLEGIA

Paraplegia is a term used to describe a physical condition in which the individual is unable to functionally use the lower extremities of the body. The term describes the topography of the impairment and does not suggest the etiology of the physical limitations, which may be of varied origin (Best, 1978).

Paraplegia results from many disorders that interfere with the brain or spinal cord's ability to transmit stimuli to the motor effectors (muscles) of the legs, or from the inability of the larger muscles of the legs themselves to act in a functional manner. It may result from cerebral palsy, which is a nonprogressive disorder of the central nervous system where the brain is involved, or from orthopedic disorders that involve the musculoskeletal system such as muscular dystrophy. In the former condition, the neurological input to the muscles may be impeded at the level of the brain. The latter involves an asymmetrical deterioration of muscle fibers, depriving the legs of the necessary activity for gross muscular action. Conditions such as spina bifida, in which there is often a physical interruption in the continuity of the spinal cord, may also cause impairment of the body's function below the level of the lesion (injury). The origin of the paraplegia can be congenital (either the disorder or predisposition is present from birth) or adventitiously (accidentally) acquired. The former may include genetically transmitted disorders such as Werdnig-Hofmann disease, where the anterior horn cells (those cells of the spinal cord having motor function) deteriorate and lose function early in the child's development, or traumatic injury, which can occur at anytime in life.

While the disease underlying the paraplegia often suggests additional concerns for management, many of these diseases are more of a concern for medical intervention than for educational. Educational management and teaching, however, must take into consideration the limitations imposed on the individual with paraplegia, as well as safety and health considerations. When paraplegia results from neurological impairment, sensory deficits to the lower segments of the body may also be sustained as well as functional deficits (Capildeo & Maxwell, 1984). These deficits, which may include bowel and bladder incontinence (Staas & La Mantina, 1984a), also require assistance from both a

psychological and hygienic perspective. The paraplegic who manifests sensory deficits and maintains a sitting posture for most of the day should avoid remaining in one position in school, at home, or in other settings for a prolonged period of time. Since sensitivity to pain may be impaired, prolonged placement in one position may increase skin irritation that goes unrecognized by the individual until sores or descubiti develop (Kosiak, 1982; Kottke et al., 1982).

In the nonsensorily impaired individual, discomfort usually accompanying skin erosion allows for the independent shift in positioning that facilitates, avoiding injury. If the primary means of movement is accomplished by use of a wheelchair, a firm seat or wheelchair insert providing a firm seat and lateral support should be used. Reliance on the webbed or sling seat often found in portable folding chairs does not allow for adequate uniform support. The paraplegic may begin to favor one side of the supportive webbed seat, asymmetrically tipping the body. To regain a vertical perspective to the environment, compensation of the spine in the opposite direction is likely to be forced, resulting in a scoliosis (lateral curvature of the spine) over time. Aside from orthopedic implications, infringement on the diaphragm may reduce vital capacities by reducing pulmonary (lung) function. This can result in shallow, rapid cycles of breathing that increase tendencies toward respiratory problems. These shallow, rapid cycles further impede reducing body noise, making localization of low-amplitude sounds more difficult and interfering with the controlled expiration necessary to speech production.

Management must also include an understanding of the nutritional needs of the individual with paraplegia. Since activities may be circumscribed, caloric intake for the active nonparaplegic is not an accurate gauge for determining diet. Such a diet would provide excess nutritive support resulting in weight gain. Diet should, therefore, be provided on an individual basis, taking into consideration the specific activity level of the individual.

The environmental experience, as regarded as part of the educational process, will be impaired if provision for available alternatives to independent ambulation are not provided. The younger child with paraplegia who is deprived of free exploration of the environment may be impeded in concept development (Connor et al., 1978). For the toddler, a device such as a scooter board or crawl-a-gator may assist in active environmental exploration. This device consists of a board on which casters are mounted. The child lies prone on the device and propels himself or herself around the floor by pushing the ground with the upper extremities. The older child may begin to use a wheelchair or a parapodium. The latter device allows the child and preadolescent with paraplegia to ambulate in an upright position to more freely explore and learn. Training in donning (putting on) and duffing (removing) the parapodium is essential to increasing the independent functioning of the individual. With developed upper extremities, the parapodium can also be used to climb stairs.

Within the classroom, a standing table may be used to support the child in an upright position, freeing the upper extremities for manual exploration of learning materials, and concomitantly avoiding static positioning. This table is ideal for use in the classroom where academics may require writing and other skills requiring hand use and lower body support. Thus for the special educator to accommodate the needs for education and management of the individual with paraplegia, a comprehensive understanding of methods and materials necessary to circumvent the functional impairedness becomes essential. This management includes positioning, locomotion, and the ability to attend in a learning situation, free from the distraction imposed by the disability. This also must occur on a case-by-case method to be successful (Mulcahey, 1992), and prevent further health complications (Herrick, Elliot & Crow, 1994).

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**CEREBRAL PALSY
MUSCULAR DYSTROPHY
SPINA BIFIDA**

PARAPROFESSIONALS

Various descriptors have been used to identify the paraprofessional in special education. MacMillan (1973) has identified as potential paraprofessionals, nonprofessional adults, older children in the role of tutor, and parents. Tucker and Horner (1977) identify a paraprofessional as any person other than the teacher who is engaged in providing educational opportunities for children with disabilities. While not considered a fully trained professional, the paraprofessional is one who is expected to possess certain competencies that will promote a higher quality and more effective educational program for individuals with disabilities.

Interest in the use of paraprofessionals in special education programs has largely been based on three issues: relieving the special education teacher from nonprofessional duties; increasing the quality of the instructional program; and meeting the needs of a burgeoning number of special education programs.

The use of paraprofessionals in the special education classroom was first reported in the 1950s (Cruickshank & Haring, 1957). The conclusions drawn from this investigation were that the teachers who had paraprofessionals assigned to their classrooms felt that they were able to do a better job of teaching. The administrators of these programs concurred with this opinion, as did the parents of the children, who felt their children had profited from the presence of a paraprofessional in the classroom. In the 1960s, as a result of professional and legislative efforts, there emerged an increased interest in the establishment of a number and variety of educational services for students with disabilities. As a result of this, there was an immediate critical shortage of professional personnel to meet the rapid expansion of special education programs (President's Panel on Mental Retardation, 1962). The paraprofessional was viewed as a potential solution to this problem (Blessing, 1967).

In the ensuing years, the concept of paraprofessionals as an answer to manpower problems and improved quality of classroom instruction gained considerable acceptance. Roos (1970) recognized the need for less sophisticated trained personnel as an answer to the shortage of trained special educators. MacMillan (1973) also felt that the use of paraprofessionals in special education programs was an appropriate means for closing the manpower gap. In addition, various authors (Hanson, 1969; Karnes, Teska, & Hodgins, 1970) concluded that the instructional program in the special classroom was enhanced by the presence of paraprofessionals. Karnes and Teska (1975) determined that the use of paraprofessionals was not only effective, but that in some instances, paraprofessionals were as capable as professional teachers in carrying out instructional programs. The available evidence supported the concept that paraprofessionals can and do serve a meaningful and significant role in special education programs. However, there emerged a further concern relative to the type of training that is necessary to

produce effective paraprofessionals, and their role in the classroom remains an issue for discussion.

Competency to function as an effective paraprofessional is, in many ways, directly related to the perceived role of the paraprofessional in the program. Competencies have been identified at various levels of sophistication. Tucker and Horner (1977) feel that training should be directly related to skills that would assist the paraprofessional in changing student behavior. They feel that this should include training in areas such as curriculum, task analysis, and even parent counseling. Greer and Simpson (1977) take a somewhat more generic approach by defining the paraprofessional as a tutor. In training for this role, they enumerate a number of competencies that are indigenous to a variety of teaching functions (e.g., assessment, programming, scheduling and teaching). Other authors (Fimian, Fafard, & Howell, 1984; Gartner, 1972) have been more specific in the identification of areas or topics that they feel are necessary to produce a competent paraprofessional. These topics entail many of the traditional child development and curriculum/method sequences, as well as characteristics, behavior management techniques, and routine clerical skills. In summary, the training program for paraprofessionals may vary depending on the individual's qualifications and experience as well as the perceived role of the paraprofessional in the assigned special education program.

The position of the paraprofessional in special education programs has usually been one of a subordinate. The paraprofessional is expected to carry out his or her assigned duties in tandem with the fully trained professional. The assumption is that while paraprofessionals may be a valuable addition to the overall program, the teacher must be regarded as the one ultimately responsible for the teaching function. However, paraprofessionals have been used in a variety of ways in the educational setting. Their duties have usually encompassed activities such as clerical work, supervision of nonacademic activities, housekeeping, acting as parent surrogates, and sometimes even as active teachers engaged in the instructional process under the supervision of the trained teacher (Blessing, 1967; French & Pickett, 1997; Greer & Simpson, 1977; MacMillan, 1973).

Concerns for the extension of educational programs to a population of individuals with disabilities that has been unserved in an educational setting (e.g., the severely and profoundly disabled) has created a potential new role for the less than baccalaureate trained (paraprofessional) teacher. Although Sontag, Burke, and York (1976) feel that teachers working with the severely disabled should be rigorously trained and possess a number of specific and precise competencies, Burton and Hirshoren (1979) view the use of well-trained paraprofessionals as teachers as a resolution of problems that are indigenous to this level of programming (e.g., available manpower, individualization of instruction, and teacher burnout). Tucker and Horner (1977) have acknowledged the need for well-trained paraprofessionals in programs for the

severely disabled and agree that it is impractical to rely on fully trained teachers to provide the individualized instruction that is necessary in these programs.

While enjoying considerable discussion, the paraprofessional role in special education has not been clearly defined. However, the role continues to be evaluated, especially in light of inclusive practices (Doyle, 1997).

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TEACHER BURNOUT TEACHER EFFECTIVENESS

PARENTAL COUNSELING

Counseling parents of children with disabilities has taken a number of different forms. Variations in counseling strategies reflect diverse professional orientations as well as differing family dynamics and needs. Because new challenges often arise as the child's disability interacts with increased demands at different developmental stages, counseling is frequently a recurrent need.

Parental counselors include teachers, guidance counselors, educational evaluators, social workers, psychologists, physicians, and other parents. Counseling can range from informal and infrequent teacher/parent exchanges to long-term programs that involve all family members. Counseling approaches can be grouped into three broad categories, those providing information about the nature of the child's disability, those offering psychotherapeutic insight into the often conflicting emotions that accompany recognition of the disability, and those providing training to improve parent/child interactions and to manage the child's behavior.

Counseling aimed at educating parents about the nature of their child's disability is probably the most common. In order for parents confronted with a disabled child to make appropriate and realistic adjustments, they need various sources of accurate and pragmatic information. The information-focused counseling provided by physician, psychologist, and/or evaluator when the child's disability is first identified is clearly crucial for parents. Information-centered counseling is also provided when teachers share their insights, goals, and expectations and when parent organizations (e.g., ACLD, ARC, Closer Look) offer pamphlets, telephone hotlines, and parent support groups.

Psychotherapeutic approaches to parent counseling focus on helping parents to work through and resolve emotional stresses and conflicts often precipitated by the presence of a disabled child in the family. Such counseling can occur with parents and counselor alone, jointly with the disabled child, or with all active family members, including siblings and even caretaking grandparents. With advances in the understanding of the complex interrelations within families,

the trend has been in the direction of including more family members in psychotherapeutic counseling (Foster & Berger, 1979). Sibling relationships represent one of those significant complexities that recently has spawned nationwide sibling support groups as well as greater consideration of siblings within the context of counseling (Grossman, 1972).

A third category of counseling is parent training programs. Through such programs, parents learn more effective means of communicating with their children and methods for better managing their children's problem behaviors. Parent training programs teach techniques such as active listening and problem solving (Gordon, 1975), ways to function as filial therapists (Guerney, 1969), methods for becoming behavioral change agents (McDowell, 1974). Numerous research studies demonstrate that parents can be effective in working with and modifying their children's behavior and that such parent involvement is generally positive (McDowell, 1976).

Increasingly, two theoretical notions, or frameworks, have informed many of the counseling approaches available to parents of children with disabilities: stages of grief theory and family systems theory. Regardless of the particular approach (educational, psychotherapeutic, or parent training), many of those who counsel parents have been guided by, or at least sensitized by, one or both of these frameworks. The first reflects the prevalent view that many, if not all, parents of handicapped children undergo some version of a mourning process in reaction to their child's disability. To varying degrees, this represents a loss of the hoped for intact, healthy child. Variations on Kubler-Ross's (1969) stages of grief theory have been proposed to explain parents' emotional journey toward productive adjustment to their child's handicapping condition (Seligman, 1979). These mourning stages include denial of the existence, the degree, or the implications of the disability; bargaining, often evident in the pursuit of magical cures or highly questionable treatments; anger, often projected outward onto the spouse or the helping professional or projected inward, causing feelings of guilt and shame; depression, manifest in withdrawal and expressions of helplessness and inadequacy; and acceptance, the stage in which productive actions can be taken and positive family balances maintained. It is commonly believed that any of the earlier stages can be reactivated by crises or in response to the child's or the family's transitions from one developmental stage to another.

Family systems theory, particularly Minuchin's structural analysis (Minuchin, Rosman, & Baker, 1978) and Haley's (1973, 1976, 1980) strategic approach provides another highly valued conceptual framework for counseling. Within this framework, families are seen as interdependent systems whose problems are relational. This view offers concepts and techniques for considering the effects on all parts of the family of intervention with one member or with one subsystem. By focusing on the dynamics of a family's structure, hierarchy, and stage in the family life cycle, family

systems theory offers a more complex, and therefore more accurate, understanding of the functioning, development, and needs of a particular family with a disabled child (Foster, Berger, & McLean, 1981).

Both family systems theory and stages of grief theory are widely applicable conceptual influences within family counseling. Neither of these frameworks mitigates against using any of a wide variety of other educational, psychotherapeutic, or parent training methods to promote growth in families with children with disabilities.

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FAMILY COUNSELING PSYCHOTHERAPY WITH INDIVIDUALS WITH DISABILITIES

PARENT EDUCATION

A child's first and lasting teacher is his or her parents. Parents help prepare the next generation to function effectively in our increasingly global and interdependent society by rearing, nurturing, and shaping their children's attitudes,

beliefs, and confidence (Smith, Perou, & Lesesne, 2002). Parents often are not prepared for their demanding and time-consuming roles. Parents have little formal training or education in how to raise children. Thus, based on parents' limited training, parent education experts have sought to develop parent education programs to help parents and other adults rear children (Hamner & Turner, 2001).

Parent education programs provide information and empower parents to fulfill their responsibilities more effectively (Smith et al., 2002). They provide parents knowledge, guidance, and understanding about their children and ways to respond to them in a positive, nurturing, and proactive manner (First & Way, 1995). Parent education programs help increase parents' confidence that they are performing their job successfully. Parent education programs may be most valuable in assisting parents who are at risk of harming or damaging their child's healthy development (Keller & McDade, 2000). Helping parents raise their children more effectively can produce positive outcomes for the child and parent and promote the general welfare of our society.

Parent education programs have been promoted through various books, manuals, and seminars (Campbell & Palm, 2004; First & Way, 1995; Smith et al., 2002). Program content differs in its theory and principles (First & Way, 1995; Smith et al., 2002). Programs often are rooted in reflective listening, Adlerian, and/or behavioral methods (Hamner & Turner, 2001; Smith et al., 2002). Reflective listening utilizes receptive and expressive communication skills. Specifically, parents increase their ability to accept and understand their child's perspective of problems or circumstances without assigning blame. The expressive language aspects of parent training involve expressing personal responsibility for a contentious issue or problem. Parents utilize "I" messages to convey feelings and to describe the child's behavior and its effects on the parent (Hamner & Turner, 2001; Smith et al., 2002). Additionally, this method seeks to explore alternative conflict resolution approaches (Hamner & Turner, 2001; Smith et al., 2002).

Adlerian methods advocate developing families in which individuals take responsibility for their behaviors, promoting self-confidence and courage in their children, establishing active communication channels, and promoting a democratic family unit (Hamner & Turner, 2001).

Behavioral methods typically are used in families with children who display behavioral problems (Thompson, Grow, Ruma, Daly, & Burke, 1993). The goal is to help parents reduce or remove undesirable behavior patterns in their children and to replace these patterns with desirable behaviors (Smith et al., 2002). For example, methods attempt to reduce or remove a child's negative behavioral patterns by better managing the child's environment and thus changing his or her behavior that exacerbates and maintains the conduct (Cheng Gorman, & Balter, 1997).

Research has not demonstrated the superiority of one method. Nevertheless, the belief that participation in a

program may be effective in promoting change is somewhat widely held (First & Way, 1995). Parent training programs may be somewhat effective with middle and low income parents who have children with developmental, learning, and behavioral programs (Thompson et al., 1993). However, most parent education programs have been unsuccessful in producing measurable and longlasting effects with families from diverse ethnic, cultural, and socioeconomic backgrounds. The ineffectiveness of parent education programs may be attributed to professionals and parent experts having insufficient knowledge or experience dealing with ethnically and culturally diverse families (McDermott, 2001). Empirically based research projects demonstrate a weak support for the efficacy of culturally sensitive parent education programs (Cheng Gorman & Balter, 1997). Thus, professionals may remain unaware of how culture may impact parenting behaviors (Smith et al., 2002).

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FAMILY COUNSELING PARENT EDUCATION PSYCHOTHERAPY WITH INDIVIDUALS WITH DISABILITIES

PARENTING SKILLS

Parenting can provide some of the most stimulating, gratifying, and rewarding life experiences. Parenting is not

an innate ability. Parenting involves a set of skills and attitudes that must be developed and practiced to achieve a level of proficiency. The development of effective parenting skills can be challenging without the presence of good models and guidance from family, friends, and parenting experts. Many parents try to expand their parenting skills by attending seminars, reading handbooks and manuals, trial and error, by talking with other parents, or obtaining information from reliable sources (Taylor, 2004). The acquisition of effective parenting skills may be more critical, complex, and prolonged when caring for a child with special needs (Taylor, 2004). Most parents plan to rear a child with no special needs and thus generally make various adjustments when rearing a child with special needs (Hamner & Turner, 2001).

Parents alter the nature of their parenting styles in order to mold and shape their child to function successfully in different environments and society. Parents adjust their parenting style based on the child's needs, temperament, and disposition, as well as different environmental circumstances. For example, compared to early childhood, when parents often are more direct, the adolescence stage of development, characterized by hormonal and puberty changes and frequent mood swings, often demands parents to function more as counselors who provide support and nurturance during difficult times. This stage also necessitates less physical guidance and setting limits, and more encouragement to become independent and self-sufficient individuals (Hamner & Turner, 2001).

Mothers and fathers with special-needs children often encounter special challenges that result in increased stress and conflicts as to how best to parent their child. Low income and minority parents of special-needs children face additional challenges and stressors. For example, they are less likely to have time to attend to the child's special needs, more difficulty accessing professional resources, and less money to purchase needed equipment. In addition, they are likely to have lower levels of educational attainment and thus have less knowledge about specialists to assist them and their special-needs child (Keller & McDade, 2000). Thus, they are likely to need more support, information, guidance, and professional advice to learn skills necessary to address their children's normal and special needs.

Parents and educators share responsibility for educating and socializing children to enable them to acquire good mental health and to contribute to society. However, the relationship between parents and educators may be contentious and riddled with animosity and distrust (Moriarty & Fine, 2001). The need for parents, educators, and parenting experts to create relationships that are collaborative and empower parents of children with exceptionalities is apparent (Lancaster, 2001). This relationship is characterized by all parties displaying care and concern for the welfare of the child (Moriarty & Fine, 2001). That is, parents and

professionals recognize that each is partner on a team, and work together to establish goals of success for the child (e.g., effective social skills). Having established achievable goals, the team would then develop a plan of action to help ensure the child is taught appropriate social skills and allowed the opportunity to practice them with peers.

The role of educators in promoting parenting skills includes serving as a role model while providing a quality education to the special-needs child, motivating and reinforcing parents' participation in their child's education process (if needed), augmenting the parents' knowledge and skills surrounding educational issues concerning their child, working collaboratively with other professionals, and informing parents of other available resources (Lancaster, 2001). Additionally, educators and parents collaborate on their child's academic and social progress, and encourage them to develop realistic expectations and goals for the child's future. Teachers are able to offer parents strategies or skills that transfers needed educational programs to the home and community (Taylor, 2004). In turn, parents can provide educators with relevant information about their child's disability, previous experiences and techniques implemented that were and were not successful in promoting academic and social success, and support school-related efforts to improve collaboration between the school and parent.

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PARKHURST, HELEN (1887–1973)

Helen Parkhurst devised the Dalton Plan and founded the Dalton School in New York City. The essence of the Dalton Plan, based on Parkhurst's concept of the school as a laboratory where students are experimenters and not just participants, was individualization of instruction through student contracts, with each student working individually at his or her own pace to carry out contracted assignments.

Early in her career, Parkhurst studied with Maria Montessori in Italy; from 1915 to 1918 she supervised the development of Montessori programs in the United States. She left the Montessori movement to put her own educational plan into practice at schools in Pittsfield and Dalton, Massachusetts. She founded the Dalton School in 1920 and served as its director until her retirement in 1942. Parkhurst lectured throughout the world and established Dalton schools in England, Japan, and China. Her book, *Education on the Dalton Plan* (1922), was published in 58 languages. After retiring from the Dalton School, Parkhurst produced radio and television programs for children and conducted a discussion program in which she gave advice on family life.

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PARTIALLY SIGHTED

The term partially sighted was used to classify and place students in special classes whose distance visual acuity was between 20/70 and 20/200 in the better eye after correction (Hatfield, 1975). In 1977 the classifications of levels of vision adopted by the World Health Organization omitted the use of partially sighted in its system (Colenbrander, 1977). As a result, this term has virtually disappeared from the literature (Barraga, 1983).

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BLIND LOW VISION VISION TRAINING VISUAL IMPAIRMENT

PARTIAL PARTICIPATION

The principle of partial participation entails the position that all students with severe disabilities (including the profoundly mentally retarded and the severely physically disabled) can acquire a number of skills that will enable them to function at least partially in a variety of least restrictive school and nonschool environments or activities (Baumgart et al., 1980). Because of the severity of their sensory or motor impairments as well as deficits in attentional and learning processes, some severely disabled students have difficulty in learning skills needed to function independently in current and subsequent least restrictive environments. Rather than denying access to these environments, proponents of the principle of partial participation believe adaptations can be implemented that will allow students to participate in a wide range of activities (Demchack, 1994) as well as experience inclusive programming. The latter, however, may not always be the least restrictive environment for students with severe disabilities.

Adaptations via modes of partial participation can take on a variety of dimensions in the activities of severely disabled learners (Baumgart et al., 1982; Wehman, Schleien, & Kiernan, 1980). Materials and devices can be used or created in an effort to adapt tasks (e.g., using an enlarged adaptive switch to operate kitchen appliances, using picture communication cards to communicate needs in a restaurant, using a bus pass instead of coins when a student is unable to count coins for bus fare, using frozen waffles rather than a waffle iron and batter when preparing breakfast). The sequence of steps in skills being taught can be modified (e.g., dress in a bathing suit before going to community pool if extra time is needed to manipulate clothing; sit on the toilet first, then pull pants down if unsteady on feet in the bathroom). Personal assistance can be provided for part or all of a task (e.g., peers push wheelchair to help deliver attendance records to office, teacher takes bread out of bag and places it in toaster prior to having student press lever on toaster). Rules can be changed or adapted to meet the needs of individual students (e.g., allow student to eat lunch in two lunch periods in cafeteria if he or she is a slow eater owing to physical disabilities). Societal or attitudinal as well as physical environments can be adapted (e.g., installing wheelchair ramps in public places, installing electronic doors in public buildings to make them more accessible for wheelchair users).

The classroom teacher will need to follow a number of steps to implement partial participation strategies suc-

cessfully. These include: (1) taking a nondisabled person's inventory of steps/skills used in a particular task; (2) taking a severely disabled student's inventory of steps used or skills exhibited for the same task; (3) determining the skills that the student with disabilities probably can acquire; (4) determining the skills the disabled student probably cannot acquire; (5) generating an adaptation hypothesis; (6) conducting an inventory of adaptations currently available for use; (7) determining individualized adaptations to be used; and (8) determining skills that can probably be acquired using individualized adaptations (Baumgart et al., 1982).

Several considerations are recommended when using individualized adaptations for severely disabled students. These include: (1) empirically verifying the appropriateness and effectiveness of adaptations in the criterion or natural environment; (2) avoiding allowing students to become overly dependent on adaptations; and (3) carefully selecting adaptations to meet needs of individual students in critically functional environments (Baumgart et al., 1980). Appropriate applications of the principle of partial participation will enhance the access of severely disabled individuals to integrated environments available to the nondisabled population at large (Brown et al., 1979; Ferguson & Baumgart, 1991).

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HUMANISM AND SPECIAL EDUCATION LEAST RESTRICTIVE ENVIRONMENT

PASAMANICK, BENJAMIN (1914–1996)

Benjamin Pasamanick began his professional studies at Cornell University, where he received his BA in 1936. During this period, he began studying physiology and biochemistry, and was accepted as the sole undergraduate advisee of Nobel Laureate James Sumner. In 1937, he attended the University of Maryland School of Medicine, earning his MD in 1941. His internship psychiatry was completed at Brooklyn State Hospital and Harlem Hospital, both in New York City. Following his psychiatric residency at the New York State Psychiatric Institute in 1943, Pasamanick became an assistant at the Yale Clinic of Child Development, where he was accepted to study under Arnold Gesell.

He subsequently held numerous faculty, research, and clinical positions at medical schools and clinics throughout the northeastern United States. He was the Sir Aubrey and Lady Hilda Lewis professor of social psychiatry at the New York School of Psychiatry, professor of psychiatry at the New York University College of Medicine, and research professor of psychiatry at the State University of New York, Stony Brook. At the time of his death in 1996, he was research professor emeritus of pediatrics at Albany Medical College.

Throughout his illustrious career as a mentor, scholar, and clinician in child psychiatry, Pasamanick maintained an interest in exceptional children, particularly those with



Benjamin Pasamanick

mental retardation. He challenged conventional practices, frequently promoting change and innovation, and sought a melding of basic research in child development with the practice and promotion of a clear conceptual framework for treatment.

Pasamanick is perhaps best known for his research on the multidimensional, multifactorial influences on children's development (Kawi & Pasamanick, 1979), particularly his longitudinal studies of the development of black infants (Granich, 1970). He was the first to demonstrate that the behavioral development of black infants, as an indicator of intellectual maturity, was indistinguishable from that of white infants. He ultimately came to believe that, early in life, intelligence and related cognitive skills are primarily biologically determined but become increasingly chronologically and socially influenced with age, eventually being driven by socioeconomic factors.

Pasamanick extensively studied mental disorders and the continuum of reproductive casualty and epidemiology (Davis, Dinitz, & Pasamanick, 1974). His research in the 1950s and 1960s focused on prenatal factors involved in mental illness and treatment of mental disorders, with his work in this area finding that at least 80 percent of serious cases of mental illness were treatable at home using drug therapy. His investigation into the state of mental health in large cities, conducted on behalf of the American Public Health Association, indicated that at least one in ten of those living in American cities, while appearing normal, had mental problems.

In the 1960s and 1970s Pasamanick served as associate state commissioner for research in the Department of Mental Hygiene, and later became associate commissioner for research and evaluation in the Division of Mental Retardation and Child Development. His work substantially influenced service delivery to children with disabilities in a variety of settings.

Among his numerous contributions, he served as president of the American Orthopsychiatric Association (1970–1971), president of the American Psychopathological Association (1967), and president of the Theobald Smith Society (1984). Pasamanick was a familiar figure at professional gatherings where he presented scientific papers, and he authored or edited numerous books and articles in scholarly journals, with more than 300 publications to his credit. His service on editorial boards included *Child Development*, the *American Journal of Mental Deficiency*, the *Merrill-Palmer Quarterly*, and the *Journal of Biological Psychiatry*.

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AMERICAN ORTHOPSYCHIATRIC ASSOCIATION

PASE v. HANNON

PASE (Parents in Action on Special Education) v. *Hannon* (Joseph P. Hannon, superintendent of the Chicago public schools at the time this case was filed) was a class-action suit on behalf of African American students who were or who might be classified as educable mentally retarded (EMR) and placed in self-contained special classes. *PASE* was established by a parent advocacy group assisted by the Northwestern School of Law Legal Assistance Clinic and the Legal Assistance Foundation in Chicago. The U.S. Department of Justice filed an *amicus curiae* (friend of court) brief on behalf of the plaintiffs. Defendants in the case were various officials employed by the Chicago Board of Education as well as the Board of Education of the State of Illinois. *PASE* resulted in a 3-week trial conducted by Judge Grady, who issued an opinion deciding the case on July 7, 1980.

The issues and expert witness testimony in *PASE* were virtually identical to those presented in *Larry P. v. Riles*, heard by Federal District Court Judge Peckham in California in a trial concluded in May 1978. The fundamental allegations were that overrepresentation of African American students in EMR special class programs constituted discrimination, and that overrepresentation was caused by the defendants' use of biased IQ tests. The plaintiffs claimed the overrepresentation from biased IQ tests violated constitutional and statutory protections, particularly the Equal Protection Clause of the Fourteenth Amendment and the nondiscrimination protections in the Education for All Handicapped Children Act of 1975 (PL 94-142) and Section 504 of the Rehabilitation Act of 1973. The plaintiffs and defendants agreed that African American students constituted about 62 percent of the total school population in Chicago, but 82 percent of the EMR population. The actual percentage of African American students classified as EMR was 3.7 percent; in contrast, 1.3 percent of Anglo American students were classified as EMR.

In a 3-week trial in 1979, the plaintiffs relied heavily on

several of the witnesses who appeared just under 2 years earlier in the *Larry P.* trial in California. In particular, the plaintiffs relied on Leon Kamin's analysis of the historical pattern of racist attitudes and beliefs among early developers of intelligence tests in the United States (Kamin, 1974). Robert Williams, a prominent African American psychologist, provided testimony concerning the differences in the cultures of Anglo American and African American students and identified a few examples of biased items. Although other witnesses appeared for the plaintiffs, the testimony of Kamin and Williams was noted prominently in Grady's decision.

Witnesses for the defendants contended overrepresentation reflected the genuine needs of African American students, who were claimed to have a higher EMR incidence owing to the effects of poverty. This emphasis on socioeconomic status as an explanation for overrepresentation was also relied on by *Larry P.* defendants, though unsuccessfully. The association of EMR with poverty has been reported for many decades throughout the western world for diverse racial and ethnic groups. The defendants also contended that any biases that might exist in IQ tests were neutralized in the placement process through the use of procedural protections such as parental informed consent, the development of a multifactored assessment that focused on educational needs, and decision making by a multidisciplinary team.

Judge Grady clearly was dissatisfied with the evidence presented by both the plaintiffs and the defendants. He noted, somewhat testily, that only cursory information on the testing question was presented in the evidence. He questioned attorneys for both sides and learned that no one relied heavily on careful analysis of each of the test items in preparing for the case. He then concluded that an analysis of each of the items on the three tests in question, the Wechsler Intelligence Scale for Children, the Wechsler Intelligence Scale for Children-Revised, and the Stanford Binet, was required for him to decide on claims of bias. Judge Grady then undertook an item-by-item analysis of the questions on the three tests.

Approximately two thirds of the space in Judge Grady's lengthy opinion was devoted to his analyses of the intelligence test items. Judge Grady provided the exact wording of the item, the correct answer, and the scoring criterion, where appropriate, for determining whether a response was awarded one or two points. This unprecedented breach of test security was initially shocking to many professionals, but no known harm or serious threat to normative standards has been reported.

Judge Grady concluded from his personal analysis of the IQ test items that only eight of several hundred items were biased. He noted that four of those eight items were not on current versions of the tests, and that those that were generally appeared at the upper limits of the test. Items that appeared at the upper limits of the test typically would not be given to students who might be considered for classifica-

tion as EMR. Grady concluded that any biases that existed on the test exerted a very small influence on classification and placement decisions, and agreed with the defendants that other safeguards, mentioned earlier, compensated for these negligible biases.

The sharply different opinions in *PASE* and *Larry P.* did not go unnoticed in the professional literature (Bersoff, 1982; Sattler 1980). The trial opinions were markedly different despite virtually identical issues and similar evidence. The reason different conclusions were reached can best be understood from an analysis of the different approaches taken by the federal court judges. Judge Grady required that a direct connection be established between biased items and misclassification of African American students as EMR. He found no such connection in Kamin's testimony about historical patterns of racism, in Robert Williams' descriptions of differences in cultural backgrounds of Anglo American and African American students, and in his own analyses of items. Grady then ruled that the absence of a clear connection between biased items and misclassification prevented the plaintiffs from prevailing. In contrast, Judge Peckham in *Larry P.* accepted allegations of item bias and concluded that the other protections in the referral, classification, and placement process were insufficient to overcome these biases. Both decisions have been criticized; *PASE* because of the method used by Judge Grady (Bersoff, 1982) and *Larry P.* because of conclusions concerning item biases that did not reflect available evidence (Reschly, 1980; Sandoval, 1979).

The plaintiffs appealed the *PASE* trial decision. However, before the appellate court ruled, the issues in the case were rendered moot by the decision of the Board of Education in Chicago to ban the use of traditional IQ tests with African American students being considered for classification and placement as EMR. This ban was part of a negotiated settlement in still another court case concerning the desegregation of the Chicago public schools. The appeal was then withdrawn by the plaintiffs. The *PASE* decision is an interesting contrast to that in *Larry P.*, but it does not have the impact of *Larry P.* for a variety of reasons.

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DIANA v. STATE BOARD OF EDUCATION
 LARRY P.
 MARSHALL v. GEORGIA
 NONDISCRIMINATORY ASSESSMENT

PATH ANALYSIS

Path analysis is a technique developed in the 1930s by Sewell Wright (1934) for the purpose of studying causal relationships among variables. Path analysis provides mathematical models expressing the direct and indirect effects of variables assumed to have causal status on variables assumed to be affected by the causal variables. A direct effect occurs when one variable influences another in the absence of mediation by a third variable. For example, one might assume that a particular educational intervention had a direct effect on student achievement. An indirect effect exists when a causal variable affects a dependent variable by influencing a third variable, which in turn affects the dependent variable directly. For example, teacher training might be assumed to affect teaching behavior, which would influence student achievement. Under these conditions, teacher training would have an indirect effect on student achievement. Its influence on achievement would occur through its effect on teaching behavior.

The mathematical models used to express causation in path analysis have their origins in regression analysis. The simplest path model is one involving the regression of a dependent variable on one or more variables assumed to explain variation in the dependent variable. For instance, student achievement might be regressed on an educational intervention assumed to affect achievement. Under this model, the intervention would have a direct effect on achievement. The residual term in the regression equation would also be included in the model. It is assumed to be uncorrelated with other variables in the equation. The residual would be treated as a causal variable indicating the effects of variables not explicitly included in the model on achievement. For instance, intelligence is a variable not explicitly identified in the model that might account for part

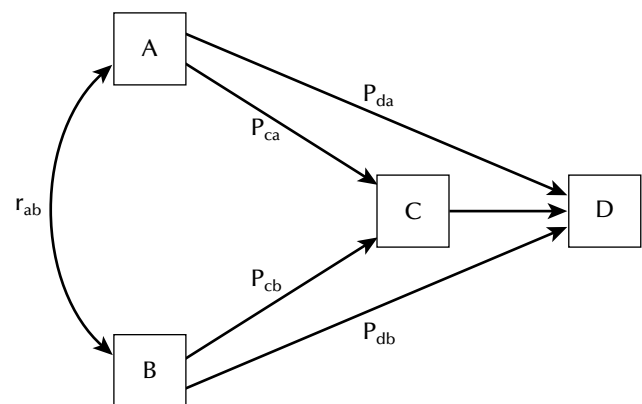
of the variation in achievement. Many other variables that might affect achievement could be identified.

Models involving indirect effects require more than one regression equation. For instance, the example given involving the indirect effect of teacher training on achievement would require two regression equations. The first would include the regression of achievement on teacher training and teacher behavior; the second would include the regression of teacher behavior on teacher training. The general rule governing the number of equations is that one equation is needed for each dependent variable.

The two models discussed to this point assume unidirectional causation. For instance, in the indirect effects model, teacher behavior is assumed to affect achievement, but achievement is not assumed to affect teacher behavior. Models assuming unidirectional causation are called recursive. Ordinary least squares (OLS) regression can be used with recursive models. Nonrecursive models assuming bidirectional causation between one or more pairs of variables require procedures that go beyond OLS regression. Duncan (1975) provides an excellent discussion of nonrecursive models.

Causal relations may be expressed in path analysis not only through mathematical models, but also through path diagrams such as the one shown in the following Figure. Variables A and B in the diagram are called exogenous variables. An exogenous variable is a variable whose variation is explained by factors outside of the causal model. The curved double-headed arrow indicates that variables A and B are related and that no assumption is made regarding the direction of the relationship. Variables C and D are endogenous variables. Endogenous variables are affected by exogenous variables and/or other endogenous variables.

The Ps in the model represent path coefficients. In a recursive model, these are standardized regression weights. Each path coefficient is interpreted as that fraction of the standard deviation in the dependent variable for which the causal variable is directly responsible. For instance, P_{da} indicates that fraction of the standard deviation in variable D for which variable A is directly responsible. The standardized regres-



Path diagram

sion weights functioning as path coefficients in path models are no longer widely used in causal modeling. The assumption that all variables in a causal model should be placed on the same scale has been challenged. Unstandardized weights are now typically used. See Duncan (1975) for a discussion of the problems associated with standardized weights.

Path analysis may be regarded as a special case of a more general technique called structural equation modeling (Bentler, 1980; Joreskog & Sorbom, 1979). The major difference between path analysis as it was developed by Wright and structural equation models is that structural equation models may include latent as well as manifest variables. A latent variable is a variable that is not observed directly, but rather is inferred from two or more manifest indicators. For example, student achievement could be treated as a latent variable to be inferred from scores on two or more achievement tests. A structural equation model expresses the effects of one set of variables on another set of variables. The variables in the model may include both latent variables and manifest variables. For instance, a model might include the effects of sex on student achievement in mathematics. Sex would be a manifest variable in this model and mathematics achievement could be a latent variable inferred from two or more test scores. Structural equation modeling represents a powerful extension of Wright's pioneering work in path analysis. With structural equation techniques, it is possible not only to represent a broad range of causal relations among variables, but also to represent a wide variety of latent variables that may be of concern in educational and psychological research.

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MULTIPLE REGRESSION REGRESSION (STATISTICAL)

PATH-REFERENCED ASSESSMENT

Path-referenced assessment (Bergan, 1981, 1986; Bergan, Stone, & Feld, 1985) is an approach that references ability to

position in a developmental sequence. The path-referenced approach has been applied in the Head Start Measures Battery (Bergan & Smith, 1984; Stone & Lane, 1991), a set of six cognitive scales designed to assist in planning learning experiences to promote the development of Head Start children. Within the path-referenced framework, ability is defined as a latent (unobserved) variable estimated from overt performance on test items. The ordering of skills in a developmental sequence is indicated by variations in item difficulty. Items of low difficulty reflect tasks related to lower levels of development, whereas items of high difficulty are associated with higher levels of development. The examinee taking a path-referenced test obtains a latent ability score referred to position in a developmental sequence and used to indicate the probability of performing the various tasks in the sequence correctly. For example, a child taking the math scale of the Head Start Measure Battery might receive a latent ability score indicating high probabilities of performing simple counting tasks correctly and low probabilities of performing more complex addition tasks correctly.

The path-referenced approach applies latent trait models (Bock & Aitkin, 1981; Lord, 1980) to the problem of referencing ability to position in a developmental sequence. The general latent trait model asserts that the probability of performing a test item correctly is a function of latent ability and certain item parameters. Item parameters that may be reflected in a latent trait model include item difficulty, item discrimination (which gives the strength of the relationship of the item to the underlying latent ability), and a guessing parameter. Latent ability and item difficulty are placed on the same scale in the latent trait model. The path-referenced approach uses the latent ability parameter to estimate an individual's ability, described as his or her developmental level. Item difficulty parameters are used to quantify developmental sequences. The fact that latent ability and item difficulty are on the same scale is used to reference developmental level to position in a developmental sequence. For example, suppose that a child taking a math test including a set of counting items receives a developmental level score of 50. Assume that the difficulty of counting to 5 was 48 and the difficulty of counting to 10 was 52. The child's position in the counting sequence would lie between counting to 5 and counting to 10.

The construction of path-referenced tests requires the testing of hypotheses about the developmental sequencing of skills constituting an ability. The hypothesis testing orientation links path-referenced assessment to cognitive research and theory. Embretson (1985) has pointed out that psychometric practice generally is far removed from the hypothesis testing tradition of cognitive psychology. Hypothesis testing is typically restricted to studies of test validity and does not include the testing of hypotheses about items based on assumptions about underlying cognitive processes. The construction of developmental sequences in path-referenced tests requires that hypotheses be advanced

related to the cognitive processes associated with tasks in a sequence. In particular, the demands associated with the processes involved in task performance must be identified so that the hypothesized ordering of skills in a sequence can be established. The sequence must then be empirically validated. Cognitive theory and research provide the basis for forming hypotheses about sequencing.

Path-referenced assessment differs in significant ways from both norm-referenced assessment and criterion-referenced assessment. Norm-referenced assessment references test performance to position in a norm group. An ability score is given indicating where the individual stands in the group. Ability is defined in terms of group position. In the path-referenced approach, ability is estimated from test performance using a latent trait model. Latent ability is then referenced to position in a developmental sequence. Path referencing indicates where the individual is in a sequence and in so doing specifies the competencies that have been mastered in the past and those that lie ahead as development progresses.

Criterion-referenced assessment references test performance to the mastery of objectives (Glaser, 1963; Nitko, 1980). The objectives may or may not reflect tasks that are sequenced (Nitko, 1980). Although latent trait models have been used in criterion-referenced assessment (Nitko, 1980), they have not been integrated into the theory underlying criterion-referenced tests. The criterion-referenced approach ignores the ability construct altogether. Overt test performance is linked directly to the mastery of objectives. In path-referenced assessment, overt performance is used to estimate ability. Ability is then related to position in a developmental sequence and used to establish the probability of correct performance of tasks in the sequence. Use of the ability construct requires that individual skills be part of an empirically validated system of knowledge. Each skill in the system contributes to ability. When one teaches a set of skills that are part of a knowledge system, ability is affected. The educator operating from a path-referenced perspective is concerned with teaching ability. The mastery of specific objectives is related to ability. The educator operating from a criterion-referenced framework is concerned with the mastery of objectives. No assumptions are made about the relationship of objectives to ability.

Path-referenced tests may be used in a number of ways. One major use has to do with the management of instruction. Information on path position can be used in establishing individualized learning experiences in educational settings. For example, the Head Start Measures Battery is used by teachers in the Head Start program to provide individualized learning experiences for children. Teachers use planning guides reflecting skills measured by the battery to plan learning experiences appropriate to each child's developmental level in each of the content areas measured by the battery.

A second use of path-referenced assessment involves

placement in a special program. Norm-referenced instruments are typically used in making placement decisions. However, path-referenced instruments also may make a useful contribution in determining placement. The major goal of placement is typically to provide a program that is appropriate to the learning needs of the student. To assist the decision-making process, information associated with path position can be related to information about the kinds of learning opportunities available in a special program. A decision to place would imply that learning opportunities congruent with path position can be provided better in the special program than in other available alternatives.

A third use of path-referenced instruments involves evaluating learner progress. Path-referenced instruments provide quantitative ability scores reflecting a continuous ability scale. Gains can be described in terms of the difference between pretest and posttest ability. Path-referenced instruments are better suited to measuring gains than frequently used norm-referenced technology because path-referenced scores do not depend on group position (Bergan, in press). Moreover, since path-referenced ability scores are linked to path position, it is possible to determine changes in the performance of specific skills that accompany progress.

A fourth important use of path-referenced instruments has to do with curriculum design. Path-referenced instruments can provide information about the structure of knowledge in specific content areas. For example, a path-referenced math scale may provide information on the developmental sequencing of math skills. Information on the sequencing of skills can be used in formulating curriculum sequences in math. It should be noted that this does not imply that the sequence of instruction should be the same as the sequence of development.

Because the path-referenced approach is new, it is too early to specify the full variety of applications that it may find in assessment. However, it is worth noting that the need for assessment providing information related to skill sequences has been recognized for many years. This need was thoroughly articulated in Gagne's (1962, 1970, 1977) work. Latent trait technology affords a practical approach to the construction of assessment instruments that are developmental in character. Latent trait technology has been widely used in assessment (Hambleton, 1983), and it is reasonable to expect that it will find increasing application in the assessment of development.

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DEVELOPMENTAL DELAYS HEAD START

PATTERNING

Patterning is also known as the Doman-Delacato treatment method for children with neurological disabilities. The center for the treatment program is located in Philadelphia under the name Institutes for the Achievement

of Human Potential. The central theory of the Doman-Delacato treatment method is the neurological organization of the individual. The theory posits that the individual progresses through four neurological developmental stages: medulla and spinal cord, pons, midbrain, and cortex. The stages finalize in hemispheric dominance. The theory further proposes that mankind develops in an orderly manner. The rationale stresses that an individual's development in mobility, vision, audition, and language follows specific neurological stages that are correlated with anatomical progress. In this treatment method, a specific program of patterning is developed for each client. The patterning features definite time sequences for selective exercises that can be imposed either actively or passively on the nervous system. It is claimed that these exercises lead to improvement in the sensory motor functions of the individual.

The Doman-Delacato treatment was popular during the 1960s. Advocates of the treatment program have reported success with a wide range of disabilities, including mental retardation, brain damage, learning disabilities, physical handicaps, aphasia, language disorders, and dyslexia. Numerous reports from professionals, paraprofessionals, and parents have confirmed the success of the treatment program. The widespread acceptance of neurological exercises was enhanced through articles published in popular magazines such as *Good Housekeeping* and *Reader's Digest*.

Medical teams, educators, and persons serving in the human services field have studied, evaluated, and researched the claims of the advocates of neurological organization theories. The numerous studies and carefully controlled research reviews do not support the purported achievements of the patterning approach.

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PEABODY DEVELOPMENTAL MOTOR SCALES

The Peabody Developmental Scales (PDMS; Folio & Fewell, 1983) is an early childhood motor development test for children birth through 7 years 11 months. The instrument includes a Gross-Motor Scale, which tests reflexes, balance, nonlocomotor, locomotor, and receipt and propulsion of objects; and a Fine-Motor Scale, which tests grasping, hand use, eye-hand coordination, and finger dexterity. The Gross-Motor Scale contains 170 items divided into 17 age levels, with 10 items at each level. The Fine-Motor Scale contains 112 items divided into 16 age levels, with 6 or 8 items at each level. Items are scored on a three-point system that distinguishes among mastered skills, emerging skills, and skills clearly beyond the child's reach.

The PDMS was normed on 617 children that were representative of the nation as a whole with regard to gender, race, ethnicity, geographic region, and urban/rural residence. Raw scores are converted into scaled scores (z-scores, T-scores, developmental motor quotients) and age scores.

Reviewers (Compton, 1996; Reed, 1985; Venn, 1986) have been generally complimentary of the PDMS, finding the instrument a comprehensive measure of a fundamental aspect of child development. Weaknesses noted include the cumbersome nature of test administration.

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PEABODY INDIVIDUAL ACHIEVEMENT TEST—REVISED/NORMATIVE UPDATE

The Peabody Individual Achievement Test—Revised (PIAT-R; Markwardt, 1989) is an individually-administered measure of academic achievement designed for children and adults, ages 5 to 22. The PIAT-R assesses six academic content areas with the following subtests: General Information,

Reading Recognition, Reading Comprehension, Mathematics, Spelling, and Written Expression. The subtests are combined to yield a Total Reading score, Total Test score, and a Written Language Composite score. Administration time is approximately 60 minutes.

All subtests except for Written Expression are dichotomously scored. Detailed scoring criteria are provided for both levels of the Written Expression subtest. All subtests except Written Expression yield standard scores, percentile ranks, age equivalents, and grade equivalents. Computerized scoring software is also available for the PIAT-R.

The PIAT-R was recently renormed, and is referred to as the PIAT-R Normative Update (PIAT-R/NU; Markwardt, 1997). A sample of 3,429 children stratified according to 1994 U.S. Census data comprised the standardization sample. Reliability of the PIAT-R/NU was demonstrated with split-half reliability coefficients of the subtests ranging from the low to mid 0.90s. The PIAT-R/NU was shown to be stable with test-retest values in the low to mid 0.90s. Validity was established by demonstrating strong correlations to other achievement measures such as the K-TEA (Kaufman & Kaufman, 1985), KeyMath-R (Connolly, 1988), and PPVT-R (Dunn & Dunn, 1981).

Reviews of the PIAT-R are generally quite favorable. Rogers (1992) comments that the test appears to be a useful instrument to both practitioners in the schools and to researchers. The subtest that continues to be the most difficult to score is the Written Expression subtest. The PIAT-R manual provides specific categories with many examples for scoring, but many examiners may find it difficult to categorize an individual child's writing nonetheless. This particular subtest is one that could utilize further research.

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ACHIEVEMENT TESTS

PEABODY PICTURE VOCABULARY TEST—THIRD EDITION

The Peabody Picture Vocabulary Test—Third Edition (PPVT-III; Dunn & Dunn, 1997) is an individually administered test of listening comprehension in the English language for children and adults ages 2 years 6 months to 90. This test is an achievement test of receptive vocabulary as well as a screening test of verbal ability for individuals who use the English language as their dominant language. The test consists of two forms, Form III A and Form III B. Each form contains four training items and 204 test items. The test items are broken down into 17 sets of 12 items each. Most examinees complete 5 sets, or 60 items. This untimed test takes an average of 11–12 minutes to complete.

Examinees are shown four black-and-white pictures, and are instructed to point to the picture that best represents the meaning of the stimulus word said by the examiner. Examinees are only required to use nonverbal responses. The starting point is determined by the age of the test taker. However, if the examinee's level of functioning is found to fall below the 25th percentile or above the 75th percentile, he or she can begin the test at the more appropriate level. Test descriptions and history, testing and scoring procedures, and standardizations or statistics can be found in the examiner's manual. A norms booklet is also included in the test for scoring purposes. Test responses and scores are recorded on performance record forms that are included with the test. (There are separate forms for Form III A and Form III B).

Standardization data for the PPVT-III were collected in 1995–1996. The sample of 2,725 individuals represented the U.S. Census data from March 1994. The sample consisted of 1,441 females and 1,284 males as well as 2,000 children and 725 adults over the age of 19. All persons in the sample were between the ages of 2.5 and 90. The following disability categories were represented in normative sample: Learning Disabled, 5.5 percent, Speech Impaired, 2.3 percent, Mentally Retarded, 1.2 percent, Hearing impaired, .13 percent, Gifted and Talented, 2.9 percent. Raw scores are converted to age equivalents, percentiles, normal curve equivalents, w-scores, and stanines using a scoring table in the test kit.

The alternate forms reliability coefficients computed from standard scores for the PPVT-III ranged from .88 to .96 with a median of .94. Internal consistency ranged from .86 to .97 with a median reliability of .94. Test-retest reliability among all forms and age groups for the PPVT-III were in the .90s. Criterion validity was examined by looking at the correlations between the PPVT-III and other tests of

intelligence and verbal abilities. The correlations between standard scores of the Peabody and the WISC-III ranged from .82 to .92 for children between the ages 7 years 11 months and 14 years 4 months. The correlations between the PPVT-III and the Kaufman Adolescent and Adult Intelligence Test were .76 to .91 for ages 13 to 17 years 8 months, and .62 to .82 using the Kaufman Brief Intelligence Test for ages 18 to 71 years 1 month. The correlations between the Oral and Written Language Scales and the PPVT-III ranged from .63 to .83 for ages 3 to 5 years 8 months and 8 years 1 month to 12 years 10 months.

The PPVT-III appears to be a reliable and valid test of receptive vocabulary. The easy administration and short testing time also add to its appeal.

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PEABODY REBUS READING PROGRAM

The Peabody Rebus Reading Program is a representational symbol system designed to teach early reading skills to children. A basic vocabulary of pictographic symbols known as rebuses represent entire words or parts of words; they provide a foundation for developing reading and comprehension skills. Rebus symbols may be classified into four basic categories: combination symbols, which primarily depict objects or actions (e.g., ball = ); relational sym-

bols, which depict locations or directions (e.g., in = , on = ); and abstract symbols, which are primarily arbitrary symbols representing ideas such as "at" =  and "too" = ). The fourth category combines symbols with alphabet letters, affixes (e.g., doing =  ing), and other rebuses (e.g., into = .

The Peabody Rebus Reading Program includes two levels. The reading level is designed as an alternative, complementary, or supplementary program for traditional readiness programs (Woodcock, Clark, & Davies, 1969). Two workbooks each containing 384 exercise frames are introduced to children. As a student marks an answer using a moistened pencil eraser, a special "invisible ink" indicates the accuracy of the selection. On completion of this level, a child will have developed several prereading skills such as matching spoken words to printed words, reading in a left-to-right direction, and comprehending rebus words and sentences. At the second level, the transition level, students progress from reading rebuses to reading spelled words. Teaching materials include one workbook and two rebus readers, emphasizing systematic substitution of spelled words for rebuses. Initially, the spelled words are paired with their corresponding rebus symbols. The symbols are gradually faded to effect transition to standard orthography. On completion of the transition level, a student will be able to read 122 spelled words, sound out words, recognize punctuation, and read stories.

The Peabody Rebus Reading Program is designed to introduce children to reading by first having them learn a vocabulary of rebuses in the place of spelled words. The program has additional application for facilitating the development of language skills.

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PEACE CORPS, SPECIAL EDUCATION IN

The Peace Corps is a volunteer program that was established in 1961 by President John Kennedy. Its goal is to help the people of interested countries and areas of the world in meeting their needs for trained manpower through the help of American volunteers. The promotion of a better understanding of Americans on the part of the people served, and a better understanding of other people on the part of Americans, are also basic goals of the program (Shute, 1986). During

the 1960s, goodwill among nations was advocated by early Peace Corps participants. During the 1970s, individuals in both the host countries and the United States recognized the need for technically skilled individuals familiar with local needs in food, job, health, and schooling areas. Thus in recent years, programs for volunteers cover such diverse assignments as work in agriculture, industrial arts/skilled trades, and health and education (Peace Corps, 1986). Over 5,200 volunteers in 63 countries now offer their services in three major world regions: Africa (Sub-Saharan Africa), Inter-America (Central and South America), and NANEAP (North Africa, Near East, Asia, and the Pacific). Training is provided to the volunteers in the language, history, customs and social-political systems of the host country.

The Peace Corps offers a program for individuals interested in special education. Volunteers can be assigned specific placements working with children displaying mental retardation, learning disabilities, emotional disturbances, blindness or visual impairments, deafness or hearing impairments, multihandicaps, or speech problems. Assignments in special education cover teacher training and direct classroom teaching. Volunteers in the teacher-training program conduct needs assessments, organize and implement workshops and seminars, develop teaching aids using locally available materials, give demonstration lessons, establish criteria for evaluation, observe teachers, and monitor teachers' progress. Those participating in the direct-teaching program help to screen and assess the special child's abilities and progress; teach classes in academics, extracurricula areas, and self-help skills; and structure activities to facilitate interactions of the special child with the family and community.

To qualify as a special education volunteer, an individual must be a U.S. citizen and be at least 18 years of age. There are also medical and legal criteria. Finally, the special education volunteer should possess a four-year degree with some preservice teaching in special education (actual teaching experience is preferred but not obligatory). All volunteers receive a monthly allowance to cover housing, food, and spending money. On completion of the two-year service commitment required of all volunteers, an allotment for every month served is provided as a readjustment allowance on return to the United States (Shute, 1986).

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COMMUNITY-BASED SERVICES VOLUNTARY AGENCIES

PEDIATRIC ACQUIRED IMMUNE DEFICIENCY SYNDROME

Since the first cases of Acquired Immune Deficiency Syndrome (AIDS) were reported in 1981, the human immunodeficiency virus (HIV) that causes AIDS has presented an epidemic unknown in modern history. Worldwide, over 20 million people have died from AIDS since the first cases were identified in 1981. In 2003, approximately 2.9 million people worldwide died of AIDS—490,000 were children. This amounts to approximately 1,350 AIDS deaths in children per day.

According to the *Global AIDS Epidemic / UNAIDS Fourth Global Report* of July 2004, more than 1,900 children worldwide are infected with HIV each day. In 2003, an estimated 4.8 million people became newly infected with HIV—630,000 of them were children. The vast majority of them were infected antepartum (20 percent before childbirth; during pregnancy); intrapartum (40 percent during childbirth), or during breast-feeding (40 percent). Antiretroviral treatment for children presents special challenges. Few HIV medicines are produced in pediatric formulations, and those available as syrups have limitations. They have a short shelf life, children sometimes object to the taste, and they remain very expensive.

In the United States approximately 25 percent of infants born to HIV-infected mothers each year are born HIV-infected. Approximately 89 percent of all children with AIDS are perinatal cases—children who contracted the virus from their mother during pregnancy or birth. Other causes of pediatric AIDS include transmission through breast-feeding, tainted blood transfusions before 1985, and sexual abuse.

The average age for diagnosis of perinatal cases is 4.1. Only 54 percent of all perinatal cases are diagnosed by the age of 7.

Children with AIDS have special needs and concerns, as the variety of manifestations that occur with pediatric AIDS is larger than with adult AIDS. Children with HIV and AIDS often suffer from central nervous system complications, the inability to combat childhood diseases, and failure of growth and development (Children's Hope Foundation, 1998).

Newborns infected with HIV live an average of less than 18 months. Presently, hemophiliacs represent the largest HIV-positive school age group, but this number is declining due to an increasing safe blood supply (Adams, Marcontel, & Price, 1989). The school environment has one of the lowest exposure rates of HIV in terms of normal contact among children. This also applies for school personnel (Adams et al., 1989). However, 25 states have mandated health education prior to graduation, and specifically education on HIV transmission and prevention (Kerr, 1989). The CDC and American Academy of Pediatrics have developed guidelines for school and day care attendance. The guidelines call for consideration of exclusion of the HIV-infected child from regular classrooms or group day care only if the child lacks control of body secretion; practices frequent hand- and object-mouthing behavior; is known to be a frequent biter; or has oozing skin lesions.

Curricula on HIV/AIDS education for special education populations have been focusing on defining health and prevention strategies (New Mexico State Department of Education, 1991). Unfortunately, it appears that very few school districts alter the HIV/AIDS curriculum to meet the needs of students with learning issues (Strosnider & Henke, 1992).

To date, nearly every court decision regarding the status of HIV-infected students and personnel attending school, has allowed the individual to stay in school in the absence of evidence that HIV can be spread by casual contact. Therefore, it is essential that school boards, administrators, and general personnel are thoroughly educated and repeatedly updated with information about AIDS. CDC guidelines recommend a team approach to decisions regarding type of educational setting for HIV-infected children. The team should be composed of the child's physician, public health personnel, parents, and personnel from the educational settings (Kirkland & Ginther, 1988). One other factor that should be addressed within the team approach is the involvement of the school's administration, counselor, psychologist, and social worker in providing emotional and social support to the HIV-infected child and children who make up his or her peer or support group, or classmates (Walker, 1991). It is crucial that at this stage of development of the AIDS disease, health policies and disease control concerns do not violate the individual's rights to privacy (Bruder, 1995) and an appropriate education.

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AIDS DYSMORPHIC SYNDROME

PEDIATRIC AUTOIMMUNE NEUROPSYCHIATRIC DISORDERS ASSOCIATED WITH STREPTOCOCCUS INFECTIONS

Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS) is a fairly recent phenomenon wherein Obsessive Compulsive Disorder and tic disorders are originated or exacerbated by a streptococcal infection. PANDAS is thought to occur when antibodies from a streptococcal infection cross-react with the brain's basal ganglia (Larson, Storch, & Murphy, 2005; Snider & Swedo, 2004). In other words, the antibodies produced by the body to ward off the bacterial streptococcal infection erroneously attack the individual. Furthermore, abnormalities in the basal ganglia are linked to behavioral and emotional problems such as Obsessive Compulsive Disorder and tics.

Five clinical criteria were identified for PANDAS (Swedo et al., 1998). First, there must be symptoms of an Obsessive Compulsive Disorder and/or tic disorder. Secondly, symptom onset must occur prior to puberty (ages 3 through 13). Third, the course of PANDAS must be distinguished by an episodic course exemplified by acute and severe onset. This sudden onset usually is described as an explosion of symptoms, unlike what is generally seen with pediatric Obsessive Compulsive Disorder. PANDAS also must be associated with neurological abnormalities such as unusual muscular movements and motoric hyperactivity. Finally, and most importantly, a group A beta-hemolytic streptococcal (GABHS) infection is or was present. In order for PANDAS to be considered, the National Institute of Mental Health suggests there be at least two Obsessive Compulsive Disorder and/or tic incidents (Larson et al., 2005; March, 2004; Swedo et al., 1998).

As case studies illustrate, children with PANDAS face many of the same pervasive impairments as those with Obsessive Compulsive Disorder and tic disorders (Allen, Leonard, & Swedo, 1995; Gabbay & Coffey, 2003; Larson et al., 2005). Further, children with PANDAS experience at least a 40 percent rate of psychiatric comorbidities. Thus, the seriousness of the disorder warrants the need for special educators, psychologists, and others to be cognizant of both the symptoms and preferred treatments.

Treatment research for PANDAS has focused primarily on antibiotics and/or immunomodulatory therapies (e.g., IV immunoglobulin and plasma exchange). However, neither of these two treatment approaches has a strong empirical basis. More recently, Storch and colleagues (2004) found cognitive behavioral therapy to be an effective treatment approach. Despite these preliminary findings, more research is needed to test the effectiveness of cognitive behavioral therapy, clearly define its diagnostic criteria, gather additional data on treatment responses, and examine the benefits of using antibiotics and immunotherapies (Larson et al., 2005).

Further, those close to the child should be aware of sud-

den out-of-character behaviors following a sore throat such as obsessive thinking, muscular and coordination problems, repetitive behaviors, and signs similar to those seen in Attention-Deficit/Hyperactivity Disorder. As mentioned earlier, atypical behaviors commonly subside and then spontaneously reoccur.

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OBSESSIVE-COMPULSIVE DISORDER TOURETTE SYNDROME

PEDIATRICIAN

A pediatrician is a medical doctor or osteopathic physician who has completed a residency in pediatrics. In addition to the medical care of the newborn, infant, child, and adolescent, the pediatrician is trained in many areas important to the overall growth and development of the child: motor development and coordination, sensory development, psychosocial maturation, and moral and cognitive development.

A wide variety of medical conditions may handicap a child's ability to learn. Some may be due to hereditary fac-

tors. Others may be prenatal and relate to the health of the mother or to direct dangers to the fetus such as infections or drugs. Some may be perinatal, occurring during or immediately following the birth process. This group includes complications resulting from the mechanics of labor and delivery. Some conditions may occur or be diagnosed only after the infant has gone home. Thus it is clear that the pediatrician has an important role in special education.

First, the pediatrician may be able to diagnose a condition that could have an adverse effect on the child's ability to learn and estimate the approximate extent of the handicap. Based on this and other relevant information, a plan for intervention and education can be developed. Second, school performance may be the first valid indication that a child is not developing normally. A comprehensive pediatric examination is a vital part of the overall assessment of such developmental problems so as to identify or rule out contributing medical factors, such as visual problems. If needed, detailed remedial measures may then be implemented (Berlin, 1976).

When necessary, the pediatrician can help by referral of the child to other specialists whose expertise may be needed to identify or treat the precise problems in question. Examples of medical specialists to whom such referral may be made include ophthalmologists for disorders of the eyes, neurologists for conditions related to the brain or other parts of the central nervous system, and ear, nose, and throat specialists for children with hearing impairments. Children's health problems may manifest themselves at school. If there is a medication or other treatment program in force, teachers can both monitor and encourage compliance with this program. Over 50 percent of all American parents have sought help from a pediatrician for school-related problems (American Academy of Pediatrics, 1978). For this reason, it is important that pediatricians and teachers maintain open lines of communication so that they may assist one another in helping children with both school-related and health problems.

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PEDIATRIC PSYCHOLOGIST

The past two decades have been a period of significant professional growth for pediatric psychology. In general, the

number of psychologists in medical settings has increased rapidly and the scope of their activities has widened enormously. Wright (1967) first used the term pediatric psychologist to refer to "any psychologist who finds himself dealing with children in a medical setting which is nonpsychiatric in nature" (p. 323). A year later, in 1968, the Society of Pediatric Psychology was founded; it eventually became a section of the Division of Clinical Psychology of the American Psychological Association. The *Journal of Pediatric Psychology* was established by the society in 1976; it has since become a major source of clinical and research publication for the field (Wright, 1993).

There are three major types of pediatric settings in which pediatric psychologists work: (1) the pediatric hospital or multispecialty general hospital inpatient unit, (2) the ambulatory care facility (outpatient clinic or private pediatric office), and (3) the comprehensive care center (e.g., kidney dialysis center, burn hospital) for chronic illnesses or chronic medical conditions, which may provide outpatient and/or inpatient services. The primary clinical responsibilities of the pediatric psychologist in these settings are basically twofold: to provide direct psychological services to patients and to consult to a variety of pediatric medical subspecialties including nephrology, cardiology, hematology-oncology, endocrinology, neurology, genetics, and surgery.

The longest history of association between psychology and primary health care is that between psychologists and pediatricians. This association has been strengthened recently by several groups involved in the training and certification of pediatricians. First, the educational role of pediatric psychologists has been highlighted by recommendations of the Task Force on Pediatric Education (American Academy of Pediatrics, 1978), which placed an increasing emphasis on training in the area of behavioral pediatrics. Second, the Committee on Psychosocial Aspects of Child and Family Health of the American Academy of Pediatrics (1982) noted the important role of the pediatrician in the evaluation and treatment of common behavioral and developmental disorders as well as somatic disorders with psychosocial etiology. This committee also stressed the value of a collaborative relationship between pediatricians and clinical psychologists in the treatment of these problems. Therefore, an increasing recognition of the role of health-related behaviors in the prevention, development, and maintenance or exacerbation of illness has helped to foster the expansion of pediatric psychology as a subspecialty within clinical psychology.

Pediatric psychologists work with a wide range of health-related and developmental problems in children and adolescents (Magrab, 1978; Varni, 1983). They are called on to deal with many common childhood problems and issues of child-rearing that are presented frequently to the pediatrician. Among these common problem areas are eating and sleeping difficulties, toilet training and bed wetting, learning and developmental disorders, and problems in child management.

Over the past 20 years, pediatricians have increasingly focused on the prevention of disease and the management of chronic childhood illnesses for which there are no known cures, such as cystic fibrosis, sickle cell disease, and juvenile diabetes. This shift in the practice of pediatrics has placed a new emphasis on patients' problems of daily living, issues of quality of life, and problems related to compliance with therapeutic regimens. It has further supported the active involvement of pediatric psychologists in the comprehensive delivery of health care to children.

Many children present in medical settings with physical symptoms of unclear origin or with symptoms having significant psychosocial components, including headaches, chronic abdominal pain, and failure to thrive. The psychosocial concomitants of physical illness in children represent a major source of referrals to pediatric psychologists.

Behavioral treatment procedures have shown considerable promise as an approach to alleviating or reducing the symptomatic behaviors associated with a number of somatic disorders in children (Siegel, 1983). Pediatric psychologists have used a variety of behavioral techniques such as biofeedback, relaxation training, and various operant conditioning procedures to successfully modify the symptoms associated with such disorders as asthma, ruminative vomiting, and enuresis.

Pediatric psychologists have also been concerned with the prevention of health-related problems. Among the problems that have received considerable attention in this area are the reduction of stress associated with hospitalization and painful medical procedures and the management of behaviors (e.g., overeating) that are associated with the development of physical disorders such as high blood pressure.

Finally, pediatric psychologists who work in hospital settings are often called upon to provide emotional support to health-care personnel who deal with children having life-threatening conditions. Professional burnout is a significant problem with staff who provide medical care to terminally ill children. The pediatric psychologist may consult with the staff to help them cope with the emotionally draining experiences that they encounter in these settings.

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PARENT EDUCATION PEDIATRICIAN PSYCHOSOCIAL ADJUSTMENT PSYCHOSOMATIC DISORDERS

PEER RELATIONSHIPS

When the topic of peer relationships is discussed in the literature, it is usually characterized as the interaction of students with disabilities with their nondisabled classmates. This is an important and relevant topic in light of the impact IDEA has had in ensuring that students with disabilities be educated in the regular classroom whenever appropriate.

Current research suggests that students with disabilities are often not included in many activities in the regular classroom. It has been shown that the classroom teacher sometimes fails to include the child with disabilities into many typical academic activities. For example, one study (Brophy & Good, 1974) found that regular classroom teachers tended to initiate more negative interactions with low-status, learning-disabled students than with high-status, nonlearning-disabled students. Other researchers have demonstrated that this type of nonproductive negative interchange between the classroom teacher and the student with disabilities will have a significant impact on the relationship between that child and his or her regular class peers (Weinstein, Marshall, Brattaseni, & Middlestadt, 1982). The negative interaction between the student and the teacher seems to solidify the low status of the low-performing student.

The relationship between students with disabilities and their peers is a complex phenomenon that is molded by many factors. Several of the more noteworthy factors are age of the child with disabilities, attitudes and behavior of the classroom teacher, type of handicapping condition affecting the student, self-concept and skill level of the student, and whether or not the regular class students have been prepared to understand the specific needs of some mainstreamed students. For example, it has been suggested that beginning in the early elementary grades

(Rubin & Coplan, 1992), the influence of the peer group increases as the child gets older. In other words, during the early years of a disabled child's school experience, parent and teacher acceptance are more important than peer approval or acceptance.

Methods to improve the peer relationships of the child with disabilities can be found in the literature. As an example of one such approach, Schwartz (1984) provides a checklist for regular class teachers to follow when preparing for the arrival of a mainstreamed child. Among other activities, teachers are asked to give regular class peers information about handicapping conditions and allow for any questions students might have. Such procedures help increase the frequency of positive interaction between the disabled child and his or her peers. This approach is particularly important with physically disabled students. Some research suggests that the physically disabled child is the least likely to be accepted by his or her nondisabled peers.

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MAINSTREAMING PEER TUTORING

PEER TUTORING

Peer and cross-age tutoring procedures have been identified in the literature as having success in the instruction of children with disabilities. Tutoring programs have been successful in improving a wide variety of academic skills. Peer tutors have been effective in teaching math (Bentz & Fuchs, 1996; Johnson & Bailey, 1974) and spelling (Harris, 1973), but have most often been applied for reading skills (Chaing, Thorpe, & Darch, 1980). Many authors identify the need to carefully prepare children before they perform as tutors (Martella, Marchand-Martella, Young, & Macfarlane, 1995; Schloss & Sedlak, 1986). Procedures for preparing children to function as tutors have not been extensively discussed in

the literature. There are few sources readily available for a comprehensive description of tutor preparation techniques that have been successfully implemented.

Although there is little research that has been conducted on particular training procedures, anecdotal information leads to the conclusion that carefully designed interactions and tutor preparation are important for the success of a tutoring program. If peer tutoring programs are to be beneficial to everyone involved, the teacher must invest time in the development, implementation, and evaluation of these instructional sessions.

One issue that designers of tutoring programs should consider is the identification of potential peer tutors. This is difficult because research has not given teachers definitive answers as to the characteristics of good peer tutors.

Some studies in special education that have shown tutoring to be effective have older students tutoring younger students (Parson & Heward, 1979). Other reports indicate that large age differences are not critical to an effective peer tutoring program (Dineen, Clark, & Risley, 1977). In fact, one peer tutoring study demonstrated that learning-disabled (LD) elementary-age students were effective in teaching other elementary LD students placed in the same resource room (Chiang et al., 1981). Therefore, based on information currently available, it is safe to conclude that tutor-tutee age difference is not in itself critical to the success of a peer tutorial program.

It appears that tutors can be selected from most special education programs. Research has demonstrated that effective peer tutors can come from either able or less able students. While studies within regular classrooms are common, low-achieving and special classroom students have also been effective tutors (Paine et al., 1983). Several studies have shown higher functioning LD students to be effective tutors for lower functioning LD classmates.

For several reasons, student assignments as tutors can be justified. Tutoring can improve self-concept, be used as a means of practicing previously learned skills, and reinforce academic or social performance. The peer tutoring program can be instrumental in helping special education students develop a more positive attitude and self-image. The success that tutees achieve in these carefully designed programs can contribute to important changes in previously unmotivated students.

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TEACHER EFFECTIVENESS

PENNSYLVANIA ASSOCIATION FOR RETARDED CITIZENS v. PENNSYLVANIA (1972)

Commonly known as the *PARC* decision, the case of the *Pennsylvania Association for Retarded Citizens v. Pennsylvania* is one of two landmark court decisions granting educational rights to the handicapped (the other is *Mills v. Board of Education of Washington, D.C.*). *PARC* and *Mills* were instrumental in the passage of state and federal laws guaranteeing equal access for the handicapped to all educational programs.

The *PARC* case was a class action suit (the suit was certified by the court as representing all similarly situated individuals in Pennsylvania) brought by the Pennsylvania Association for Retarded Citizens and 13 mentally retarded students. The suit was brought because three students had been denied attendance in the public schools of Pennsylvania. The case was brought under the equal protection and due process clauses of the Fourteenth Amendment to the U.S. Constitution. In *PARC*, the plaintiffs argued that allowing the state to provide a free public education to some of its citizens while denying others of its citizens the right

to attend the same schools or to receive an appropriate education at state expense was unfair and denied equal protection of the law. They also argued that handicapped children were excluded from public education without access to due process. (The Fourteenth Amendment does not deny the ability of a state to deprive a citizen of any fundamental right; however, before an individual can be deprived of life, liberty, or property by a state, the state must demonstrate a compelling interest and must grant the citizen a hearing and other such protection as may be deemed necessary under the due process clause.)

In deciding for the plaintiffs, the court clearly acknowledged that admitting seriously disturbing, profoundly retarded, physically handicapped children would be difficult and expensive at all levels; however, the court ruled that the interests of the handicapped were protected by the Fourteenth Amendment and that this protection outweighed the difficulties created by providing an education to the handicapped. The decision was extensive in its requirements and many of its provisions are routinely included in present statutes such as the Individuals with Disabilities Education Act and its predecessor, the Education of All Handicapped Children Act of 1975 (PL 94-142). The *PARC* decision required the state to provide a free, appropriate education to all handicapped children regardless of the nature or extent of their handicaps; to educate handicapped children alongside nonhandicapped children to the extent possible; to conduct an annual census to locate and serve handicapped children; to cease and desist from applying school exclusion laws, including prohibition of serial suspension practices; to notify parents before assessing a child to determine the presence of a handicap and prior to placement in a special education program; to establish procedures to meet the due process requirements of the Fourteenth Amendment should disagreements arise regarding the school's decision about a handicapped child's educational placement or program; to reevaluate handicapped children on a systematic basis; and to pay private school tuition if the school refers a child to a private school or cannot reasonably meet the needs of a handicapped child in a public setting. Later interpretations of the *PARC* decision by other courts have concluded that the schools must also use proven, state-of-the-art teaching methods with the handicapped (under the requirement of providing an appropriate education).

Following the *PARC* decision and the subsequent ruling in *Mills*, a flood of suits in various states came forth arguing for the rights of the handicapped to equal educational opportunities. Few of these cases were even litigated, however, as most states during the period 1972 to 1974 passed and funded legislation requiring local school districts to provide special education programs for the handicapped.

The *PARC* decision and related cases had a profound effect on special education as currently practiced. *PARC* fostered a rapid change in American schools, bringing into local schools, for the first time in many cases, children with

severe disabilities, including profound levels of mental retardation, deafness, blindness, multiple handicaps, and severe orthopedic impairments.

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**CONSENT DECREE
 EQUAL EDUCATIONAL OPPORTUNITY
 EQUAL PROTECTION
 INDIVIDUALS WITH DISABILITIES EDUCATION
 IMPROVEMENT ACT OF 2004 (IDEIA)
 LEAST RESTRICTIVE ENVIRONMENT
 MAINSTREAMING
 MILLS v. BOARD OF EDUCATION OF DISTRICT OF
 COLUMBIA**

PEOPLE FIRST

People First is a self-advocacy organization run by and for people with mental retardation. It has the dual purpose of assuring the availability of the services, training, and support needed to maintain and increase the capabilities of people with developmental disabilities for leading independent and normal lives; and of demonstrating to society that the disabled are people first and handicapped second (People First, 1984). Groups of mentally retarded people are taught to organize their affairs, run meetings, and make decisions and carry them through. All of this is accomplished with minimal help from nonhandicapped advisers. To a large extent, these groups are not only concerned with the needs and problems of mentally retarded people, but also the needs and problems of all handicapped people. Statewide and national conventions of self-advocacy groups have been held and an international self-advocacy movement of People First groups is emerging.

One of the first self-advocacy groups was Project Two, which operated in Nebraska. In 1968 many institutionalized mentally retarded individuals were moved to community-based facilities; hence Project One was deinstitutionalization. Deinstitutionalized people felt they needed a sounding board—a self-help group; hence Project Two. Similar developments occurred in Oregon, where there were self-help groups. Three mentally retarded members and two nonhandicapped advisers attended a conference for mentally handicapped people in British Columbia, Canada. They returned inspired with the idea of starting an organization

of people with mental retardation who would put together such conferences. This was the beginning of the People First movement in America. What is interesting is that the movement started up 2 years after Project Two but was unaware of the other group's existence.

Self-advocacy groups have sprung up in America and Britain. Such groups are challenging traditional views of mental handicaps, handicapped people, and mentally retarded persons who can speak for themselves. Self-advocacy groups stretch nonhandicapped people's expectations and attitudes, thereby helping to create a new independence for mentally handicapped persons. In California, People First was contracted by the State Council of Developmental Disabilities to critique the current service system for the developmentally disabled. The unique aspect of this project is that it was entirely conducted by the consumers of the services and was not the work of professionals.

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ADVOCACY FOR CHILDREN WITH DISABILITIES ADVOCACY ORGANIZATIONS

PERCENTILE SCORES

A percentile score is a score derived from the relative position of a raw score in the entire distribution of raw scores. The raw score must possess at least rank information; i.e., raw scores must be able to be ranked. Usually we assume at least intervals for the raw scores, so that a one-point difference has the same meaning for all possible scores. Percentile scores lose this interval quality.

The calculation of a percentile score is based on the number of scores lower than the raw score being changed or transformed. A percentile score of 50 means that half (50 percent) of the scores in the raw score distribution fall below the score under consideration. This percentile score is also called the median. A percentile score of 10 means 10 percent of the scores are lower, and a percentile score of 90 means 90 percent of the scores are lower.

Percentile scores are not equal intervals. That is, a 10 percentile point difference has a different meaning when examined for a score of 10 or 50. The difference between percentile scores of 10 and 20 may represent many raw score points, while the difference between 50 and 60 may

represent only a few. This is because raw score distributions typically have most scores clustered around the average score, perhaps two thirds of the scores within one standard deviation, so that 10 percent of the scores will occur within a few points of each other. At the extremes of the score distribution there are few people, and 10 percent may represent a large raw score range. Percentile scores should not be treated as interval scores. They cannot be routinely added, subtracted, divided, or multiplied to obtain anything sensible. Their primary use is to inform the user of the relative position of a raw score with respect to all other raw scores. In standardized testing, in which a norm sample has been carefully sampled, the percentile score tells us how an observed raw score compares with the norm group distribution of raw scores.

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GRADE EQUIVALENTS MEASUREMENT

PERCEPTUAL AND MOTOR SKILLS

Perceptual and Motor Skills (titled *Perceptual and Motor Skills Research Exchange* in 1949) is published bimonthly. Two volumes a year total between 2,000 and 3,000 pages. About 30 percent of the articles are submitted from outside the United States. The purpose of this journal is to encourage scientific originality and creativity from an interdisciplinary perspective including such fields as anthropology, physical education, physical therapy, orthopedics, anesthesiology, and time and motion study. Articles are experimental, theoretical, and speculative. Special reviews and lists of new books received are carried. Controversial material of scientific merit is welcome. Submissions are examined by multiple referees, and critical editing is balanced by specific suggestions as to changes required to meet standards.

A survey made in the 35th year of publication showed that *Perceptual and Motor Skills* was listed for the preceding decade in the top 5 percent of psychology journals for numbers of citations elsewhere of its articles and total numbers published of refereed, selected archival articles. For more than 30 years this journal has consistently maintained a policy of being highly experimental, open to all defensible points of view, encouraging of new and often unpopular ways of approaching problems, and protective of authors by careful but open-minded refereeing and editing.

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PERCEPTUAL CONSTANCY

Perceptual constancy refers to the ability to perceive objects possessing invariant properties such as size, shape, and position in spite of changes in the impression on the sensory surface. Essentially, this means that one recognizes a chair as not only a chair but as the same chair regardless of the viewing angle. Even though an object may have been seen only from a single point of view, we are often able to recognize that object from different distances and from nearly any angle of view.

Perceptual constancy seems to be largely an innate skill (Martindale, 1981). For example, when we observe from a great distance a man who is 6 feet in height, he may appear to be only an inch tall; however, he will be perceived as roughly his correct height nevertheless. Normal individuals can easily perform such tasks with objects not previously seen whenever any other environmental cues are present.

Perceptual constancy is an integral part of overall visual perception and is involved heavily in the early reading process. Disorders of perceptual constancy are relatively rare, but they do occur and can wreak havoc with early learning. Children learn to recognize letters and words even though they see them printed in a variety of orthographic representations. Much variability of printing by children and their teachers occurs during the early learning stages as well, yet children master these various representations with relative ease. The generalization necessary to performing such tasks of visual pattern recognition requires perceptual constancy. Children with mild disturbances of perceptual constancy or higher order visual pattern recognition will have great difficulty with many school tasks, but especially with reading. The disorder is low enough in incidence, however, that accurate estimates of its prevalence are unavailable.

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DEVELOPMENTAL TEST OF VISUAL PERCEPTION—SECOND EDITION PERCEPTUAL DEVELOPMENT, LAG IN PERCEPTUAL TRAINING

PERCEPTUAL DEFICIT HYPOTHESIS

The perceptual deficit hypothesis, a once widely accepted view of learning disabilities exerted a dominant influence on special education teaching and evaluation practices from the early 1960s to the mid-1970s. While the perceptual deficit hypothesis encompasses a number of variants, its central notion is that learning disabilities arise from perceptual-motor dysfunction of neurological origin (Cruickshank, 1972). Learning-disabled children are viewed as having deficient form perception and/or visual analysis, and these deficiencies are believed to be the central feature of their difficulties in learning to read.

This view of learning disabilities widely influenced special education practice through the writings and programs of Kephart (1960), Getman (1962), Barsch (1965), and Frostig (1961). Remedial programs reflected this orientation by emphasizing gross and fine-motor training, ocular exercises, spatial orientation, balance board training, visual discrimination, sequencing, closure exercises, etc., as necessary prerequisites to more direct teaching of academics. It was believed that such foundation training in sensory-motor functions would remediate underlying processing deficits and was a required prerequisite to higher order, conceptual, or symbolic learning.

Proponents of the perceptual deficit hypothesis were influenced by Piaget's theories concerning the role of maturation and motor functioning in perception, by gestalt psychology's emphasis on perceptual development, and by Strauss and Lehtinen's (1947) work with brain-injured children. In their programs for learning-disabled children, these pioneers of special education translated stage theories of learning literally into hierarchies of preacademic remediation activities that sought to develop motor, visual, and visual-motor skills prior to focusing on academic learning. In theory, the development of academic skills required mastery of these lower-level functions.

By the mid-1970s, the perceptual deficit hypothesis and its concomitant remedial programs began to receive severe and substantial criticism. Aspects of the underlying theory were questioned and fault was found with the early foundation research. The overly simplified and literal translation of theory into practice was decried as an essential misinterpretation of the concept of perception. New research indicated that learning disabilities, and reading disabilities in particular, were attributable more to problems in the verbal realm than to perceptual deficits (Vellutino et al., 1977).

Tests used to diagnose specific aspects of perceptual deficit came under particularly heavy fire. The most commonly used, the Frostig Developmental Test of Visual Perception (DTVP; Frostig, 1961), was criticized for its weak theoretical foundation. In addition, the DTVP was found to have insufficient factorial validity, meaning that its subtests do not actually tap distinct and separate perceptual functions and therefore cannot be validly used to specify different remedial activities. Thus the widespread use of this test for

diagnostic/prescriptive purposes was resoundingly invalidated. Additionally, perceptual training based on the Frostig test was found to have no relation to academic progress and only a negligible effect on DTVP performance itself (Hammill, Goodman, & Wiederholt, 1974). There arose the ethical issue of spending children's limited classroom time on pseudo prerequisite exercises with no validated relationship to academic achievement.

Remediation based on the perceptual deficit hypothesis, along with remediation based on the Illinois Test of Psycholinguistic Abilities (ITPA), continues to be debated under the broader rubric of underlying process training. Underlying process training has come to represent a genre of emphasis within special education in general, and within the study of learning disabilities in particular. Proponents of one or another of the process orientations seek to psychologically parse special students into a variety of processing strength/weakness categories in order to pinpoint areas of underlying need. While this effort has had appeal to many special educators because of the puzzling performance discrepancies of learning-disabled students, its basic assumptions have been seriously questioned.

The assumptions of a process orientation are that human performance can, in fact, be parsed into psychologically distinct categories, that any given parsing categories are valid compartments, that valid tests exist with which to parse, and that remediation based on underlying processing profiles will transfer to functional and academic learning. Currently, the state of the art in psychology and special education does not support any of these assumptions.

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PERCEPTUAL DEVELOPMENT, LAG IN

PERCEPTUAL DEVELOPMENT, LAG IN

Lag in perceptual development has been hypothesized as a major cause of learning difficulties in children by Kephart, Delacato, and Getman, among others. In general, these theorists believe there is a sequential series of strategies children use to process information from the environment; if learned incompletely at any stage, these strategies will cause learning difficulties at higher levels. These theorists maintain that proficiency in perceptual functioning provides an essential foundation for academic learning. Furthermore, they presume children experience academic failure because of developmental lags in these perceptual systems, lags that can and must be ameliorated before academic learning can occur. Although varying somewhat in theoretical orientation, these researchers, as well as Frostig, Barsch, Ayres, Doman, S. Kirk, and W. Kirk, advocate perceptual training to both establish the necessary foundation for and enhance the acquisition of academic learning. Their research provides much of the foundation for current work in the field of learning disabilities (Smith, 1984).

An early proponent of perceptual-motor training, Kephart (1971) believed that motor learning underlies all learning. Basing his theory on works of Hebb, Strauss, Werner, Piaget, and Montessori, Kephart hypothesizes that perceptual development occurs through motor activity and corresponding sensory feedback. Once developed, the perceptual system functions without sole reliance on motor response. It is only through completion of this developmental sequence that the child can readily acquire concepts necessary for academic learning. To ameliorate the underlying developmental limitations and distortions that Kephart believed result in academic failure, he developed a training program based on gross motor activities such as posturing and balancing, locomotion, and throwing and catching balls.

Delacato believes training specific locomotor tasks will influence various centers in the brain and other perceptual and cognitive functions controlled by these centers. One critical aspect of his theory is the establishment of hemispheric dominance to improve speech and other sensory functions. He advocates training the child in unilateral hand use and monocular activities and removing music from the child's environment (Cratty, 1979). Maintaining that unmastered stages of neurological development result in reading and other academic difficulties, Doman and Delacato (Ayres, 1975) emphasize remedial activities designed to recapitulate their hypothesized sequence of neurological development. In an effort to establish the unilateral cerebral dominance believed critical in treating reading difficulties, they prescribe training to attain sleep posturing, crawling, and activities that foster unilateral hand, eye, and foot dominance.

Getman holds a position similar to Kephart. Like Kephart he proposes movement as a prerequisite to learning. Unlike Kephart, he emphasizes the importance of vision in

the learning process and uses vision in a global sense. He hypothesizes that deficiencies in some visual components will lead to learning difficulties (Cratty, 1979). Designed to enhance academic success, particularly reading, Getman's training program includes locomotor and balancing activities as well as eye-hand coordination and other tasks to enhance ocular function.

Frostig (Frostig & Horne, 1964) maintains that poor perceptual development precludes conceptual learning, resulting in academic difficulties. Focusing on visual-perceptual learning, training in gross motor activities and paper and pencil tasks follows assessments using Frostig's Developmental Test of Visual Perception (DTVP). According to Frostig, when integrated with regular academic tasks, these activities promote sensorimotor development, ameliorating dysfunctional perceptual processes and enhancing academic performance.

Barsch's (1967) *movigenics* curriculum emphasizes the academic value of efficient cognitive and physical movement. Like previous theorists, Barsch views the child as a perceptual-motor being whose successful development depends on proper spatial orientation. *Movigenics* emphasizes activities that enhance visual-perceptual and motor development.

Ayres' (1975) sensorimotor integration theory posits that the foundations to learning are established through the integration of sensory feedback to the brain. Maintaining that perception and movement are dependent on proper sensory integration, Ayres postulates numerous deficits resulting in poor perceptual-motor functioning. To increase integration and facilitate academic learning, Ayres advocates sensory stimulation through activities such as rolling, spinning, and swinging exercises.

Kirk and Kirk (1971) advocate a different approach to the diagnosis and remediation of learning difficulties. Focusing on the communication abilities of the child, Kirk and Kirk provide psycholinguistic evaluation and training to facilitate academic learning. Although training focuses on auditory and visual perception, Kirk and Kirk advocate training focusing on the individual's weak areas.

Although numerous perceptual-motor theories and training programs exist, research findings to support the theories on which they are based or validate their efficacy have not been found. Hammill, Goodman, and Wiederholt (1974) reviewed studies investigating the effects of the perceptual training programs of Frostig, Kephart, and Getman on readiness skills, intelligence, and academic achievement. Of the studies reviewed, positive effects of training on intelligence and academic achievement were not demonstrated and readiness skills improved in only a few cases. In a study of the effects of Delacato's training method on reading ability and visual-motor integration, O'Donnell and Eisenson (1969) found no improvements in either visual-motor integration or reading ability. Further, a number of researchers, professional groups, and parent groups have severely criticized Delacato's theory and program (Aaron & Poostay, 1982).

Finally, in an evaluation of 38 studies employing Kirk and Kirk's psycholinguistic training model, Hammill and Larsen (1978) found only six demonstrating positive results and concluded that the efficacy of psycholinguistic training remains nonvalidated. Although perceptual and psycholinguistic training theorists maintain the efficacy of their treatment programs, others question the large amounts of time and money expended on these unsubstantiated perceptual-training programs (Hammill et al., 1974). Research may validate their value in certain cases, but general use appears unwarranted.

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- of the five basic senses: vision, hearing, smell, taste, and touch. Perceptual distortion typically occurs in conjunction with schizophrenia, severe depression, and psychomotor and ideopathic epilepsies. Schizophrenics are particularly susceptible to perceptual distortion and often process incoming sensory information abnormally via attenuation or reduction. Schizophrenics traditionally have been thought to underestimate tactile, auditory, and visual stimuli in particular. Related to perceptual distortion is evidence that schizophrenics have a defective sensory-filtering mechanism that does not allow them to focus on the most relevant of stimuli at any given time (Pincus & Tucker, 1978). Perceptual distortions that mimic the schizophrenic's perceptual distortions also may be induced by various psychoactive drugs. Prolonged sensory deprivation can also produce perceptual distortions and full-blown hallucinations.
- In contrast to schizophrenics, depressed and epileptic individuals exaggerate the intensity of incoming stimuli. Psychomotor seizures produce the most specific of the perceptual distortions but they tend to be ideopathic. Perceptual distortions may also be considered a soft sign of neurological impairment and may occur with learning disabilities, though the latter is far less frequent than commonly believed.

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CHILDHOOD SCHIZOPHRENIA PERCEPTUAL DEVELOPMENT, LAG IN SEIZURE DISORDERS

PERCEPTUAL-MOTOR DIFFICULTIES

Perceptual-motor development is recognized as a basic foundation for later learning. The perceptual deficit hypothesis holds that academic difficulties underlie perceptual deficits (Daves, 1980) and that improving the perceptual processes will bring about improvement in academic achievement. Frequently, children with serious learning disorders have difficulty with spatial orientation, eye-hand coordination, and body image. The early work of Strauss and Lehtinen (1947) described such disorders using the term brain-injured, but later such disorders were labeled the Strauss syndrome by Stevens and Birch (1957). They described the child with perceptual-motor difficulties as one who showed disturbances (separately or in combination) in perception, thinking, and emotional behavior.

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NEUROLOGICAL ORGANIZATION REMEDIATION, DEFICIT-CENTERED MODEL OF

PERCEPTUAL DISTORTIONS

Perceptual distortion is a clinical term referring to aberrant reception and interpretation of stimuli by one or more

Kinsbourne (1968) drew an analogy between the developmental syndrome of cognitive deficits and the acquired Gerstmann syndrome in some adults with parietal lesions in the dominant hemisphere. In both syndromes, he noted selective delay in the ability to recall and use information regarding relative position of items in spatial or temporal sequence; selective difficulty in learning to read and write; spelling errors characterized by errors of letter order and script malorientation; delayed acquisition of finger order sense; inability to discriminate between right and left; and difficulty in arithmetic. He concluded that the developmental syndrome probably represented a developmental lag rather than an indication of localized or lateralized cerebral damage.

There is little question regarding the importance of the development of perceptual-motor skills. Cratty (1975) notes that a child with perceptual-motor difficulties cannot translate thoughts into written and printed form with the same precision as a normally developing child. Such a child also may possess various perceptual deficits within one or more modalities (touch, kinesthesia, vision, audition) that may combine as evidence of a defective nervous system and lead to learning problems. Cruickshank (1979) also emphasized that perceptual processing deficits or neurological dysfunction underlie learning problems. Such problems are related to receiving, processing, and responding to information from outside the environment and from inside the child's own body. The ability to understand, remember, think, and perform perceptual-motor skills all precede the ability to read, write, or master arithmetic. Strategies to assist children in the overall learning process were developed (Kephart, 1963) based on the notion that perceptual-motor deficits are primarily organic in nature, and further, that they can be remediated by the development of specific skills such as form perception, eye-hand coordination, and temporal-spatial relationships.

Both Frostig (1975) and Kephart (1975) emphasized the need to develop skills in their natural order. They stressed the effect of motor processes on perception and the effects of perception on cognitive processes (i.e., the use of vision and motor skills or activities in the formation of a concept). In a similar manner Barsh (1963) developed a curriculum, movigenics, involving a progressively more complex sequence of activities in which children explore and orient themselves in space. Barsh's emphasis was on the development of muscular strength, dynamics, balance, space, body awareness, and rhythmicity.

Controversy exists regarding the efficacy of such programs. Much of the research to replicate beneficial results linking perceptual motor training to academic achievement (Balow, 1971; Goodman & Hammill, 1973; Zigler & Seitz, 1975) suggests that the claims are unwarranted. Little evidence has been found to support the use of perceptual-motor activities in the treatment or prevention of disabili-

ties in reading or other specific school subjects. However, other research tends to confirm earlier claims (Ayres, 1972; Gregory, 1978; Masland, 1976; Neman, 1974). There is continued interest in and support for determining the benefits of specific sensory-motor training.

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MOVIGENICS

VISUAL-MOTOR AND VISUAL-PERCEPTUAL PROBLEMS
VISUAL PERCEPTION AND DISCRIMINATION

PERCEPTUAL SPAN

Perceptual span is the amount of information that is acquired during the eye fixation. In reading our visual field can be divided into three different regions with respect to fixation: foveal, parafoveal, and peripheral. Although acuity is very good in the foveal (the central 2 degrees of vision), it is not nearly as good in the parafovea (which extends to 5 degrees on either side of fixation), and it is even poorer in the periphery (the region beyond the parafovea). Therefore, on tasks such as reading, we move our eyes to place the fovea on that part of the text we want to see clearly.

An important finding in reading research is that the size of perceptual span is not constant and varies as a function of text difficulty. The size of the span is smaller when the level of difficulty is high.

Eye-contingent display change techniques (e.g., moving window technique, moving mask technique, or boundary technique) were developed and are used to determine how much information can be obtained in a given eye fixation (Rayner, 1998). All studies using these techniques have shown that perceptual span is limited and asymmetric. It extends from about 4 character spaces to the left of the currently fixated character to a maximum of about 15 character spaces to the right. However, for the orthographies, such as Hebrew, that are printed from the right to left, perceptual span is asymmetric to the left of eye fixation. The asymmetry is not "hard-wired": it varies from language to language. Bilingual readers can alter the area from which they extract information when they switch from language to language.

Characteristics of the writing system influence not only the asymmetry of the span but also the overall size of it. Thus, perceptual span of Japanese readers is about 13 characters when the print is arranged horizontally. When reading vertically, the span is about five to six characters. Readers of Chinese have an asymmetric perceptual span extending from 1 character space to 3 character spaces to the right. Not only can the characteristics of the writing system but reading skill as well influence the size of the perceptual span. Beginning readers have smaller spans (about 12 letter spaces to the right of fixation) as compared to skilled readers (14 to 15 letter spaces).

Research has also focused on the perceptual span of blind people (Bertelson, Mousty, & D'Alimonte, 1985). The most common system for alphabetic languages is known as Braille. For the majority of Braille readers the size of perceptual span is just one letter. They read with one finger (almost always an index finger) one letter at a time. Some

skilled Braille readers use two index fingers to read, increasing their reading speed by almost 30 percent.

Although total perceptual span is limited to about 15 letter spaces, the area within which word identification takes place is even more limited. Generally this word identification span does not exceed 7 to 8 character spaces to the right of fixation, and readers can recognize a word to the right or sometimes two short words.

A question as to whether readers are able to acquire information from below the line that they are reading has been examined (Rayner, 1998). The results revealed that readers typically focus on the currently fixated line. The information below the fixated line is not comprehended, unless it is the specifics of a task or characteristics of the orthography.

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PERCEPTUAL TRAINING
VISUAL EFFICIENCY

PERCEPTUAL TRAINING

Many theorists believe that perception is a learned skill; therefore, it is assumed that teaching or training can have an effect on a child's perceptual skills (Lerner, 1971). Once perceptual abilities have been assessed, there are various teaching procedures and programs that can be used to improve perceptual skills.

Some of the most frequently used educational programs for children with learning disabilities have focused on perceptual training activities. While many of these perceptual training programs have emphasized visual or visual-motor training, there are also perceptual training activities in the areas of auditory perception, haptic and kinesthetic perception, and social perception. In spite of all the available material on these perceptual training programs, many researchers have questioned their effectiveness as a way to

improve school learning (Hallahan & Cruickshank, 1973; Hammill & Larsen, 1974).

Since similar perceptual training activities have been used in many different programs, it is often unclear who first used them (Hallahan & Kauffman, 1976). However, most of these training activities are based on theories that began with the work of Werner and Strauss (1939). The following descriptions of some of these perceptual training programs provide an overview of these theories and activities.

Newell Kephart worked closely with Werner and Strauss and derived many of his educational techniques from them. This perceptual-motor theory of learning disabilities stresses that perceptual-motor development helps the child establish a solid concept of his or her environment and that perceptual data only become meaningful when they are connected with previously learned motor information (in Kephart's terms, when a perceptual motor match occurs). Children with learning problems are viewed as having inadequate perceptual-motor development, manifested by motor, perceptual, and cognitive disorganization. Kephart argues that these children are unable to benefit from standard school curricula (Lerner, 1971).

The book *The Slow Learner in the Classroom* (Kephart, 1971) presented Kephart's perceptual-motor training program, which included activities involving chalkboard training, sensory-motor training, ocular-motor training, and form-perception training. The chalkboard training activities were recommended for promoting directionality, crossing the midline, orientation, tracing, copying, and eye-hand coordination. The activities presented in the sensory-motor training portion of the program were designed to help the child coordinate the movements of his or her body. Balance beams, balance boards, "angels in the snow" exercises, and trampolines are used to develop total body coordination in the gross motor systems. Ocular-motor training was proposed to help children gain control over their eye movements; it includes activities for ocular pursuit in which the child follows objects visually. Because of Kephart's belief that motor activities influence visual development, the activities in the form-perception training include assembling puzzles, constructing designs from matchsticks, and putting pegs in pegboards (Hallahan & Kauffman, 1976).

Getman (1965) also proposed a model that attempts to illustrate the sequences of children's development of motor- and visual-perceptual skills. This model, called the visuomotor complex, is applied in a manual of training activities. *The Physiology of Readiness: An Action Program for the Development of Perception in Children* (Getman, Kane, Halgren, & McKee, 1964). The program described in this model has activities in the following six areas: general coordination, balance, eye-hand coordination, eye movements, form perception, and visual memory. The exercises in the general coordination section deal mainly with movements of the head, arms, and legs; they are designed to provide children with practice in total body movement. A balance

beam is used for most of the activities in the balance section; the activities emphasize the use of visual perception for the acquisition of better balance.

The eye-hand coordination program involves the children in chalkboard exercises that are designed to increase their ability to coordinate eyes and hands. Activities in the eye-movement program are aimed at increasing children's ability to move their eyes rapidly and accurately from one object to another, while the form-perception program has children using templates to trace shapes on the chalkboard and on paper, eventually leading to the drawing of the figures without templates. The final part of the program, the visual-memory activities, uses a tachistoscope or slide projector to flash slides of figures for children to name, trace in the air, circle, trace on worksheets, or draw. The purpose is to develop children's visual imagery skill by showing more complex figures for shorter periods of time as the children become more proficient.

Frostig and Horne (1964) have a visual-perception training program designed for remediation or readiness training. The Frostig Program for the Development of Visual Perception has activities in the areas of eye-motor coordination, figure ground, perceptual constancy, position in space, and spatial relations. Each of these areas has worksheets for the teacher to use with the children. The eye-hand exercises focus on coordinating eye and hand movements by having the children draw lines between boundaries. The figure-ground exercises have the children find and trace figures embedded within other lines and figures. Perceptual generalization is emphasized in the perceptual constancy exercises; the children are trained to recognize that objects remain the same even if presented in different forms, colors, sizes, or contexts. The position in space exercises have the children place themselves in various positions (e.g., over or under) in relation to objects in the room; worksheets are also provided that require the children to discriminate objects in various positions. Finally, the spatial-relations exercises have the children do worksheets to observe spatial relationships.

Barsch's movigenic theory proposes that difficulties in learning are related to the learner's inefficient interaction with space. The training program that evolved from this theory has a series of activities that are a planned developmental motor program (Barsch, 1965). There are three main components to this curriculum: postural-transport orientations, which include muscular strength, dynamic balance, body awareness, spatial awareness, and temporal awareness; percepto-cognitive modes of gustatory, olfactory, tactual, kinesthetic, auditory, and visual activities; and degrees of freedom of bilaterality, rhythm, flexibility, and motor planning. Chapters on each of these aspects of the program are included in the curriculum along with exercises to use with learning-disabled children.

Several books and training manuals that focused on training motor skills were written and developed by Cratty (1973). These materials present exercises similar to those

found in physical education programs for the purpose of enhancing motor skills and improving a child's cognitive abilities.

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MOVIGENICS

PEREIRE, JACOB R. (1715–1780)

Jacob R. Pereire, an early educator of the deaf, was the originator of lip reading and the creator of the first manual alphabet for the deaf that required the use of only one hand. Pereire also demonstrated that speech can be understood by using the tactile sense to perceive the vibrations and muscular movements produced by the voice mechanism.

Pereire conducted schools for the deaf in Paris and Bordeaux, and his methods were further developed by de l'Épée and Sicard at the National Institution for Deaf-Mutes in

Paris. In recognition of his work, Pereire received an official commendation of the Parisian Academy of Science, was made a member of the Royal Society of London, and was awarded a pension by King Louis XV.

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PERFORMANCE-BASED STANDARDS

Performance-based standards describe the knowledge and skills that a teacher must demonstrate with an acceptable level of competency (Interstate New Teacher Assessment and Support Consortium [INTASC], 1992). A performance-based standard goes beyond a description of the requisite knowledge or skill. Rather, it describes the application of the knowledge and skills and the degree of competency expected, specifying both the nature of the evidence (i.e., a test, videotaped lesson) and the quality of expected performance (Marzano & Kendall, 1997). Performance-based standards differ from curriculum standards, statements that describe what will happen in the classroom, and content standards, statements that describe what a learner should know and be able to do (Elliott, 1996; Marzano & Kendall). Performance-based standards for teachers should be aligned with content standards for students and be consistent with state licensing requirements (Elliott). For example, this student content standard, "Students read and understand a variety of materials" (Colorado Model Reading and Writing Standards Task Force, 1995) is aligned with the performance-based standard, "The teacher has demonstrated the ability to plan and organize reading instruction based on ongoing assessment" (Colorado Department of Education, 2000).

Performance-based standards are an outgrowth of the standards movement of the 1980s and 1990s (Marzano & Kendall, 1997). This educational initiative began with the publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983), a report on the state of education in the United States. This report included among its recommendations standards of performance for both students and teachers (National Commission on Excellence in Education). Diane Ravitch, former U.S. Assistant Secretary of Education, is considered by many educators to be the primary force behind the standards movement. She defined standards as "clearly defining what is to be taught and what kind of performance is expected" (Ravitch, 1995).

With the publication of *A Nation at Risk*, political and

educational leaders began to rethink what K–12 students and their teachers should know and be able to do. In 1989, the National Council of Teachers of Mathematics became the first of many specialty associations and state departments of education to publish content standards for students (Marzano & Kendall, 1997). In 1986, the Carnegie Task Force on Teaching as a Profession released its report, *A Nation Prepared: Teachers for the 21st Century* (Carnegie Corporation of New York, 1986), which urged the teaching profession to set standards of performance for teachers and called for the establishment of the National Board of Professional Teaching Standards (NBPTS). The creation of the NBPTS in 1987 prompted discussions of standards for teachers and resulted in the initial development of performance-based standards for accomplished veteran teachers (INTASC, 1992). These performance-based standards have since become the model for initial state licensure standards for beginning teachers (INTASC, 1992) and accreditation standards for university teacher preparation programs (National Council for Accreditation of Teacher Education, 2004).

At the dawn of the twenty-first century, performance-based standards provide a nationally unified focus throughout the entire teacher career continuum (Quatroche, Duarte, Huffman-Joley, & Watkins, 2002). For experienced teachers, performance-based standards for National Board Certification recognizes advanced levels of competence (NBPTS; 2005). For initial state licensure, performance-based standards reflect the “knowledge, dispositions, and performances deemed essential for all beginning teachers” in order to help all students achieve state content standards (INTASC, 1992, p. 3). In the early 1990s, the National Council for Accreditation of Teachers (NCATE) required that all its specialty associations, including the Council for Exceptional Children (CEC), to revise its standards to be performance-based (NCATE, 2004). In 2001, NCATE required accredited university teacher preparation programs to use performance-based standards in place of the traditional approach of listing required courses (NCATE, 2004).

Performance-based standards require a method of evaluation that assesses performance as well as knowledge and skills. The NBPTS pioneered the use of portfolios to evaluate teacher performance for National Board Certification (Quatroche et al., 2002). These portfolios include videotapes of teacher-student interaction, student work samples, and teacher analyses and commentaries. The INTASC performance-based assessments are modeled after the NBPTS portfolios and contain similar artifacts (Weiss & Weiss, 1998). Assessments are based on evidence provided by the teacher that shows how teaching behavior directly contributes to student learning. Accredited university teacher education programs must align with state and national performance-based assessments, which demonstrate that the teacher candidate “knows the subject matter and can teach it effectively so that students learn” (Wise, 2000b). As of 2000, NCATE expects accredited institutions

to use performance-based assessments to evaluate teacher candidates (Wise, 2000a).

There is a growing consensus among educators that performance-based standards and assessments have improved the preparation of teacher candidates, the licensing requirements of novice teachers, and the recognition of accomplished veteran teachers. In turn, this ultimately helps ensure that K–12 students receive a higher quality of instruction (Douglas & Fennerty, 1994; Quatroche et al., 2002; Wise, 2000a). For preparing and licensing new teachers, performance-based standards and assessments provide a more effective way of evaluating what prospective teachers know and can do than can be gleaned from examining course syllabi and grades (Douglas & Fennerty, 1994; Quatroche et al.; Wise, 2000a). The rigorous performance-based standards and assessments for accomplished teachers developed by the NBPTS have helped teaching become “a profession more comparable to others such as medicine, law, and engineering” (Quatroche et al.). Finally, a growing body of converging evidence suggests that veteran teachers who attain high NBPTS performance-based standards have consistently superior performance than their peers who do not have Board Certification, and produce more knowledgeable and skillful students (Quatroche et al.).

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PERFORMANCE INSTABILITY

Performance instability refers to inconsistent functioning on a given task across time. As a characteristic of children with disabilities, performance instability often is confused with a second type of variability referred to by O'Donnell (1980) as intraindividual discrepancy. Whereas performance instability denotes changeability within a single domain across time, intraindividual discrepancy refers to variability across different performance areas within a similar time frame.

Historically, performance instability has been viewed as a distinctive characteristic of learning-disabled children. Strauss and Lehtinen (1947) reported dramatically unstable performance among their pupils. Similarly, Ebersole, Kephart, and Ebersole (1968) indicated that learning-disabled children inconsistently retained previously learned materials. More recently, Swanson (1982) typified the learning-disabled population as performing in a fragmented, inconsistent manner. In addition, performance instability is included explicitly and implicitly in well-known classification schemes for identifying learning-disabled students, such as the Strauss syndrome (Stevens & Birch, 1957), Clements' symptoms of minimal brain dysfunction (Clements, 1966) and attention-deficit/hyperactivity disorders (American Psychiatric Association, 1994). Moreover, learning disabilities teachers appear to agree on the importance

of performance instability as a descriptor of their students (Aviezer & Simpson, 1980).

Nevertheless, the validity and usefulness of performance instability as a salient learning disabilities characteristic is weakened by at least two facts. First, work in two areas that are conceptually related to performance instability—attention disorders and impulsivity—demonstrates that learning-disabled children do not behave distinctively when compared with pupils with different labels of exceptionality. Second, research exploring performance instability among normal and mildly handicapped learning-disabled and behavior-disordered students indicates that the three groups are essentially comparable in the extent to which they manifest performance instability on academic tasks (Fuchs, Fuchs, & Deno, 1985; Fuchs, Fuchs, Tindal, & Deno, 1986).

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ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IMPULSE CONTROL

PERINATAL FACTORS IN HANDICAPPING CONDITIONS

A number of perinatal factors increase the risk of handicapping conditions in the newborn. Social factors include lack of prenatal care; maternal age; inadequate maternal nutrition; use of alcohol, tobacco, or drugs (Alcohol, Drug Abuse, and Mental Health Administration, 1992); stress; work; handicapping condition (Lord, 1991); and fatigue. Maternal disease factors such as hypertension, diabetes, and heart disease may also affect fetal condition at birth. However, alterations in the birth process itself may contribute to the development of fetal handicapping conditions. Preterm labor, postterm labor, premature rupture of membranes, multiple births, antepartum hemorrhage, breech presentations, Caesarean sections, and forceps deliveries all add to the risk of unfavorable fetal outcomes and handicapping conditions (Avery & Taeusch, 1984).

The purpose of prenatal care is to provide ongoing education and evaluation during pregnancy. Serial evaluations permit the physician or midwife to uncover actual or potential morbid states and institute timely interventions with the potential for improved fetal outcome. Early detection of urinary tract infections, hypertension, heart murmurs, protein or sugar in the urine, too little or too rapid uterine growth, or swelling of extremities provides the health-care team with the opportunity to arrest the development of the more serious maternal cardiac or renal disease, hypertension, premature labor, or complications of unexpected multiple births. Therefore, lack of good prenatal care can and often is associated with poor fetal and/or maternal outcome (Harrison, Golbus, & Filly, 1984).

Maternal age represents a nonspecific influence on fetal outcome at birth. Adolescent women 15 years and younger have increased incidences of newborns with neurologic disorders and low birth weights. Women 40 years and older are at increased risk for stillborns or infants with chromosomal abnormalities (Avery & Taeusch, 1984).

Inadequate maternal nutrition and insufficient maternal weight gain of less than 14 pounds have been associated with low infant birth weight. The heavy use of alcohol during pregnancy increases the newborn's risk for growth retardation, microencephaly, cardiac anomalies, and renal anomalies. Tobacco use during pregnancy increases the newborn's risk for low birth weight, prematurity, and even stillbirth. Prescribed, over-the-counter, or recreational drugs may have an adverse effect on the neonate. The probability of a drug causing harm is dependent on the drug itself, the dose, route of administration, stage of gestation, and the genetic makeup of the mother and fetus. Drugs increase the risk of low birth weight, chromosomal abnormalities, organ anomalies, and even fetal death. Further, drugs can create problems with resuscitation and potential withdrawal phenomenon in the newborn (Hobel, 1985).

Stress, work, and fatigue have been associated with an increased risk for poor fetal outcome. The association between stress, work, fatigue, and pregnancy complications is not clear, but it is related to growth retardation and/or low birth weight of the neonate (Creasy, 1984).

Maternal disease factors associated with poor fetal outcome and handicapping conditions include hypertension, diabetes, and heart disease. Hypertension is the most frequently identified maternal problem associated with growth retardation. Hypertension is also associated with preterm labor, low birth weight, cerebral palsy, mental retardation, and fetal death (Avery & Taeusch, 1984).

Poorly controlled maternal diabetes with associated high blood sugars is related to poor fetal outcome. The risk for growth retardation, congenital defects, and brain damage is increased by the complications of diabetes. Maternal heart disease with associated reduced cardiac output is also associated with the increased risk of prematurity and low birth weight (Hobel, 1985).

Prematurity with its complications is associated with many handicapping conditions. Postterm pregnancy refers to pregnancy lasting longer than 42 weeks. Postterm pregnancy is associated with an increased risk for growth retardation, distress, and even death of the neonate (Hobel, 1985).

The premature rupture of membranes is associated with an increased risk of premature birth and an increased risk for neonatal infection (Oxorn, 1986). Multiple births, antepartum hemorrhage, breech presentation, Caesarean section, and forcep deliveries also increase the risk of handicapping conditions to the newborn. These alterations in the birth process increase the risk for neonatal mortality, central nervous system hemorrhage, asphyxia, and long-term neurologic disability (Avery & Taeusch, 1984).

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ETIOLOGY

INTERVENTION

LOW BIRTH WEIGH INFANTS

MARCH OF DIMES

NEONATAL BEHAVIORAL ASSESSMENT SCALES

PREMATURITY

PERKINS-BINET TESTS OF INTELLIGENCE FOR THE BLIND

The Perkins-Binet Tests of Intelligence for the Blind (Davis, 1980) were designed to assess the intellectual functioning (verbal and performance) of visually impaired children. Shortly after their appearance it became evident that there were a number of significant flaws in the tests. Reviewers (e.g., Genshaft & Ward, 1982) found the test manual lacking in technical information. Instructions for administering were vague, and in some instances, incomplete. The tests were lengthy and difficult to administer, and scoring criteria were unclear. There were also concerns about psychometric adequacy and the lack of reliability and validity data (Guterman, Ward, & Genshaft, 1985). The tests have since been withdrawn from the market.

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BLIND

VISUALLY IMPAIRED

PERKINS SCHOOL FOR THE BLIND

The Perkins School for the Blind was the first private residential school for the blind chartered in the United States. It was founded by Samuel Gridley Howe in 1832 to serve two blind students and was originally called the New England Asylum for the Blind. At that time asylum was all that even the most fortunate blind person could expect out of life. However, Howe, a strong believer in education, changed the name to the New England Institution for the Education of the Blind. Today, it is known as the Perkins School for the Blind, after Thomas Perkins, a prominent Boston merchant and one of the school's early benefactors. Probably one of its most well-known students was Helen Keller, who attended Perkins from 1887–1892.

The Perkins programs are comprehensive and serve a wide variety of blind, visually impaired, deaf-blind, and multiimpaired children, teenagers, and adults. The programs include preschool services, ages 0–5; primary and intermediate services, ages 6–15; secondary services, ages 15–22; deaf-blind program, ages 5–22; severely impaired program, ages 16–22; adult services, ages 18 and up; and community residence and independent living services, ages 18 and up. The philosophy is to prepare students and clients to meet everyday life to the best of their abilities emotionally, socially, physically, vocationally, and avocationally (Annual Report, 1998).

Perkins also provides other services besides direct care, including the Samuel P. Hayes Research Library, which collects print material about the nonmedical aspects of blindness and deaf-blindness. In addition, it houses a museum on the history of blind and deaf-blind and a historic collection of embossed books for the blind. The Howe Press is located at Perkins. It is the developer and manufacturer of the Perkins Braille, used throughout the world. The Howe Press also distributes children's books, braille accessories, and other aids and materials for blind and low-vision students.

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BLIND

VISUAL IMPAIRMENT

PERMANENT PRODUCT RECORDING

Permanent product recording is an observation method where student products are measured and recorded. This

method is the most common technique that teachers use to collect and record student data (Cooper, Heron, & Heward, 1987). Alberto and Troutman (2006, p. 62) write that permanent products are “tangible items or environmental effects that result from a behavior.” This method, also known as outcome recording, allows a teacher or researcher to count a result of a behavior after it has been omitted (Wolery, Bailey, & Sugai, 1988). Examples of behaviors that are suitable for permanent product recording include homework completion, answers on a test, pencil marks left on a desk, audio or video recording of student behavior, and school vandalism.

Permanent product recording has many advantages, including (1) having the option to count the behavior right after it occurred or waiting until a later time to count and record the behavior (Sulzer-Azaroff & Mayer, 1991); (2) being able to maintain a durable sample of the targeted behavior (Alberto & Troutman, 2006); and (3) being able to focus on teaching, instead of systematically observing a student during instruction (Maag, 1999). As with all direct observation systems, collecting interobserver reliability data is critical. The formula for calculating interobserver reliability for permanent product recording is taking the number of agreements and dividing by the agreements plus disagreements, then multiplying by 100. This formula will give you the percentage of agreement between the primary observer and an independent observer.

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BEHAVIORAL ASSESSMENT

PERSEVERATION

Perseveration is used in special education to describe behavior that is continued by a child beyond the normal (Cuneo & Welsch, 1992) end point of the behavior and that is accompanied by difficulty in changing tasks. Perseveration is

considered to be a soft neurologically sign and is believed to be most common among learning-disabled and brain-injured children. Lerner (1971) discusses perseverative behavior as one of the four major behavioral characteristics of learning-disabled children.

In formal assessment, perseveration is often noted on such tasks as the Bender-Gestalt, in which the child is required to reproduce a series of nine drawings. Figures one, two, and six of this series require lines or rows of circles, dots, and repeating curves. Once started on the task of making dots, circles, or repeating curves, some children have great difficulty in stopping and subsequently distort their drawings greatly. Such children seem to get carried away by a specific activity, repeating it over and over, unable to stop. Perseveration is most commonly seen in motor tasks, but it can also be present in verbal behavior and even in thought patterns.

On intelligence tests such as the Wechsler Intelligence Scale for Children-Revised, children may display verbal or ideational perseveration. Although not formally scored as perseveration, this behavior lowers children's intelligence test scores significantly. On tasks such as telling how two everyday, common objects are alike (the similarities subtest of the WISC-R), some children will give the same fundamental answer to each pair of items; they seem unable to alter their mental set once established. Anxiety may also promote perseverative behavior.

Levine, Brooks, and Shonkoff (1980) have presented an interesting, useful view of perseveration and have provided some excellent clinical examples. They note that transitional events, or even minor changes in routine, constitute common impediments to many children with learning disorders, many of whom are perseverative. At the same time, some of these children are impersistent at academic or other tasks, a finding that seems paradoxical on the surface. However, as Levine et al. note, there may be a fine line between impersistence and perseveration, and the two traits coexist in some children.

Difficulties with adaptability may be a component of a general biological predisposition to inefficient attentional strategies. Children who cannot shift tasks, activities, or mental sets may be reflecting anxiety linked to issues of loss or fear of failure, or may be demonstrating neurological abnormalities associated with frontal lobe or possibly reticular function. Perseverative responses occur more frequently in the case of frontal lobe dysfunction (e.g., see Reynolds & Horton, 2006). Koppitz (1963, 1975) has reviewed a number of studies in which children with brain damage demonstrate higher levels of perseverative behavior than do normal children of the same age. Perseveration is one of the best indicators of neurological impairment on the Bender-Gestalt Test (Koppitz, 1963, 1975) and is one of the least subjective scoring categories.

The following clinical illustrations from Levine et al. (1980) are useful in understanding the different features

of perseveration as well as its relationship to impersistence.

1. A child may find the daily progression of routines difficult to manage. Getting up in the morning, dressing, eating breakfast, and preparing for school may present problems. The youngster may linger over each activity. The same pattern may appear when the youngster returns from school; there may be problems initiating routines, coming in from play, disengaging from the television set, and preparing for sleep. Parental efforts to induce a shift of activities may result in severe temper tantrums and unbridled anger.
2. A child may persist at an activity, wishing to sustain it beyond a reasonable period. Such a youngster has difficulty in suspending a project for continuation. Sometimes the behavior reflects a child's wish to pursue some enterprise that is likely to yield success rather than to move on to a riskier endeavor that might culminate in failure; such tenacity may be an avoidance response. At other times perseveration may be a consequence of cognitive inertia with regard to shifting sets. For example, some children with memory deficits or difficulties in establishing object constancy may experience change as overwhelming.
3. A child may resist any changes in daily routine. His or her behavior may deteriorate at the prospect of an unexpected visit to a relative. The youngster may be upset by the arrival of cousins for an overnight visit or by having to give up his or her own bed for the night. Some children crave consistency, or a sameness that helps provide order in a world that seems chaotic. They do not appreciate surprises and instead insist on knowing exactly what is going to happen each day (pp. 240–241).

Painting (1979) has commented, appropriately, that perseveration may occur because a particular response is so gratifying to a child that it is repeated primarily for the pleasure involved. A child with learning problems who gets a test item correct or who has mastered a particular activity may perseverate in the behavior because it promotes feelings of success and aids the child's self-esteem.

Perseveration may occur for a variety of reasons. Good diagnosis must go beyond designation of the presence of perseveration to explaining why the child perseverates. Treatment choices are likely to be impacted significantly by etiology in the case of perseverative behavior.

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BENDER-GESTALT TEST

PERSONALITY ASSESSMENT

There are numerous personality theories, definitions, and perspectives that incorporate a variety of individual traits. In general, personality is thought to include characteristics such as attitudes, interests, emotional reactions, impulses, behavior, temperament, and social interaction styles that are stable over time. Developmental influences of personality are thought to include hereditary predispositions, conscious and preconscious motivations, as well as environmental experiences (Fadiman & Frager, 2005). A clinician's theoretical orientation often influences which personality components are emphasized and which assessment methods are used.

Evaluation procedures are determined by the intended purpose of the assessment. The goals of psychological evaluation within school systems typically are to diagnosis, determine need for educational support services, and design appropriate interventions. Within clinical settings, the goals of assessment for children may include trauma stabilization, diagnoses of pathology common to psychotic disturbances (e.g., schizophrenia hallucinations), and treatment planning. Neuropsychological assessments for children also include measures of personality that may have implications for brain injuries, lesions, and diseases known to produce profound emotional changes (e.g., disinhibition, euphoria) related to specific anatomical structures (Lezak, 1995). In some cases, children may receive personality assessments from multiple providers in collaboration with special education personnel to design comprehensive school- and community-based intervention (e.g., a bulimic adolescent who is receiving family therapy in a clinical setting while simultaneously receiving individual counseling and behavioral modification services at school to address purging behaviors).

Psychologists conducting individual personality assessments are expected to be knowledgeable of national, state, and school district laws, policies, and guidelines applicable to psychoeducational assessment. The Individuals with Disabilities Education Improvement Act (2004), state statutes, state board of education rules, and state department of education technical papers provide directives pertinent to such issues as the qualities that need to be assessed, under what conditions students may be provided special education services, and the degree of restrictiveness in educational settings. Diagnostic symptomology for personality disorders is delineated in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (American Psychiatric Association, 2000). Best practices in psychological assessment dictate careful consideration in selecting evaluation methods and an understanding of validity and reliability issues (American Educational Research Association, 1999).

Assessment methods include clinical interviews, behavioral observations, and psychological measurement instruments. Clinical interviews may be conducted with students and caregivers, including teachers. Objectives of the interview include gathering information on: developmental and medical history; establishing onset, severity, and the chronic nature of problem behaviors; understanding social, economic, and cultural contexts; and identifying support systems (Sattler, 2002). Interviews may be unstructured or follow a protocol (e.g., Behavior Assessment System for Children Structured Developmental History, Semistructured Clinical Interview for Children and Adolescents).

Behavioral observations strive to provide objective and quantifiable data in a systematic manner. Specific behaviors are identified and defined (e.g., yelling that disturbs classroom instruction). Then occurrences are documented across settings. These data can be analyzed to establish the frequency, duration, pattern, time-of-day, and location of particular behaviors (Kelley, Noell, & Reitman, 2003). School personnel may design charts, graphs, or tables to collect and summarize these data. There are also numerous published observational coding systems (e.g., Classroom Observation of Conduct and Attention Deficit Disorders) tailored to specific diagnoses' symptoms (Sattler, 2002). However, these observation measures typically do not offer national norm comparison data for a wide range of behaviors (e.g., on/off task, disrupting others).

Psychological measurement instruments for personality can be divided into two categories, objective and projective. Objective measures, often in the form of rating scales, provide quantitative scores and strive to adhere to rigorous validity and reliability standards. This is accomplished through expert review of test item content, statistical analysis of theoretical constructs, comparisons of score stability, standardized administration, and establishing national norms for scores. Personality rating scales may provide test items across a broad range of behaviors from internal-

izing (e.g., anxiety, depression) to externalizing (e.g., Oppositional Defiant) disorders (e.g., Minnesota Multiphasic Personality Inventory, Millon Adolescent Personality Inventory). Instruments (e.g., Brown ADD Scales) also may be narrow in scope, focusing on specific syndrome symptoms such as Attention-Deficit/Hyperactivity Disorder or skill sets such as social skills (e.g., Social Skills Rating System). Rating scales also may measure positive characteristics for specific traits such as extroversion, introversion, or learning style preferences in temperament (e.g., Student Styles Questionnaire).

Projective personality measures typically are less standardized, utilize more open-ended response methods, rely more heavily on clinical interpretation, may not be normed, and thus may not include national comparison scores. Some recent projective instruments and scoring systems strive to provide greater standardization in administration and scoring (e.g., Roberts Apperception Test for Children, Exner scoring for Rorschach). Projective measures may include story-telling techniques, drawings, or sentence completions (e.g., House-Tree-Person Drawing Technique) that often are interpreted based on theory. The use of projectives measures is somewhat controversial, especially in regard to their validity and reliability (Kamphaus & Frick, 2000). Best practices in all psychological assessment require the integration of multiple methods and multiple sources of information across multiple settings and over multiple time periods considering multiple traits when making diagnostic or placement recommendations.

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**BEHAVIOR ASSESSMENT SYSTEM FOR CHILDREN—
SECOND EDITION
MMPI
PERSONALITY INVENTORY FOR CHILDREN**

**PERSONALITY INVENTORY FOR
CHILDREN—SECOND EDITION**

The Personality Inventory for Children—Second Edition (PIC-2) is a multidimensional, objective questionnaire for use in the evaluation of children and adolescents ages 5 to 19. It assesses both broad and narrow dimensions of behavioral, emotional, cognitive, and interpersonal adjustment and is completed by parents or parent surrogates. The PIC-2 consists of a Standard Form with 275 descriptive statements with a true-and-false response format; it takes about 40 minutes for the parent to complete. There is also a 96-item Behavioral Summary derived from the longer Standard Form that takes about 15 minutes to complete. This version can be used for screening, research, or monitoring behavior change.

Basic instructions for the respondent are printed in the Administration Booklet and on the Answer Sheet. The respondent is informed that the inventory contains statements that will help describe his or her child's feelings, behavior, and family relationships. The respondent is directed to mark *T* if the statement is true or mostly true and *F* if the statement is false or not usually true. There are three response validity scales that are part of the PIC-2, including Inconsistency, Dissimulation, and Defensiveness. The nine adjustment scales include Cognitive Impairment, Impulsivity and Distractibility, Delinquency, Family Dysfunction, Reality Distortion, Somatic Concern, Psychological Discomfort, Social Withdrawal, and Social Skills Deficits. There are 21 subscales of the adjustment scales. The manual that accompanies the PIC-2 contains all of the information needed for effective use of both the Standard Form and Behavioral Summary versions of the questionnaire.

The standardization sample of the PIC-2 included 2,306 students in the United States, from kindergarten through the 12th grade. The sample was representative of the 1998 U.S. census with respect to gender, age, geographic region, ethnic background, and parents' educational level, and included a spectrum of socioeconomic status conditions. The scales of the PIC-2 provide *T* scores that have a mean of 50 and a standard deviation of 10.

The internal consistency reliability for the longer and more stable adjustment scales ranges from .75 to .91, with a median of .84. The adjustment scale retest reliability ranges from .66 to .90, with a median of .82, for a 1-week interval. Criterion validity was evidenced by moderate cor-

relations between adjustment scales of the PIC-2 and other instruments, including the Clinician Symptom Checklist, Personality Inventory for Youth (PIY), and the Student Behavior Survey (SBS), with the majority of correlations ranging from .30 to .60.

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PERSON-CENTERED PLANNING

Teaching youth with disabilities the skills necessary to become self-determined individuals has become an increasing priority for educators, adult service professionals, and families. With the help of a supportive group of people, person-centered planning (PCP) has emerged as a powerful mechanism for facilitating self-determined futures for youth with disabilities (O'Brien & O'Brien, 2000; Whitney-Thomas & Timmons, 1998). Person-centered planning is considered a "process-oriented approach" (Condon, Fichera, & Dreilinger, 2003) that empowers people with disabilities by viewing them as the primary director of their life. The planning process encourages an individual to involve personal and community networks in planning for the future. The process includes articulating a vision and coordinating resources and supports to make the vision a reality. By encouraging youth and their families to identify and express preferences and assume responsibility for personal goal setting and taking action on their goals, PCP is clearly aligned with the objectives of transition planning and interagency collaboration (Condon, Fichera, & Dreilinger).

Person-centered planning is an approach for learning about people with disabilities and, through an ongoing process of social change (O'Brien & O'Brien, 2000) focuses on creating a lifestyle that can help people contribute in community life. PCP is a way of planning together with people to express and live according to the values of contribution, community inclusion, and choice. According to Mount (1997, p. 8), "this form of planning is a powerful tool because it provides the capacity to develop new visions for people, re-imagine what is possible for them, and reevaluate their own roles and investments in making these ideals livable."

Table 1

Characteristics of traditional systems	Characteristics of person-centered systems
Goals focus on decreasing specific negative behaviors.	Images of the future are grounded in the belief that the person will experience positive, empowering changes in their life.
Program categories and service options that are often segregated are identified.	Positive changes are centered on specific community settings and engaging in valuable roles within those settings.
Many goals and objectives reflect minor accomplishments that can be attained in existing programs without making changes.	Ideas that seem unrealistic and impractical indicate that major changes are needed within existing systems, not the person.

Traditional forms of transition planning for individuals with disabilities are based on the developmental model; that is, emphasizing the deficits and needs of the individual with disabilities and viewing them as needing to be fixed (Smull, 1997). Responsibility for decision making is assigned to professionals who, in turn, inundate the individual with disabilities and his or her family with endless program goals and objectives.

Person-centered planning reflects an alternative set of values and messages by basing its procedure on the promise of community inclusion for everyone. Rather than assume the lead with responsibilities, professionals must instead listen to, and take direction from, individuals with disabilities and their families (Lehr & Brown, 1996). Many of the activities, people, and experiences these individuals enjoy should provide professionals with clues on which specific interest areas need to be expanded and increased. Similarly, situations that frustrate individuals with disabilities should convey the message to the professional that the setting, environment, activity, or people in the situation need to change (Butterworth & Strauch, 1994).

Person-centered planning helps the professional to change from the superior role of expert to a more humble role as a partner whose motto is: "work so that people have many ways to be a part of community life" (Mount, 1997, p. 57). Professionals must work to negotiate organizational changes to remove barriers that may stand in the way. Table 1 provides a summary of the differences between traditional views and person-centered planning views (Smull, 1997) on supporting individuals with disabilities.

Common Approach to Person-Centered Planning

Personal futures planning. Personal futures planning is based on two core contexts (O'Brien & Lovett, 1997): (1) pro-

viding support to people with disabilities and their families and friends and (2) providing assistance to service providers who want to transform the system they work within. The process focuses on developing a personal profile of the individual with disabilities by identifying strengths within the individual, the individual's significant others, and within the community (O'Brien & Lovett, 1997). Next, the Personal Futures Planning process engages the participants in creating images of a desirable future, identifying obstacles and opportunities, designing strategies, committing to next steps, and identifying needed systems changes. Finally, the participants are asked to commit to various responsibilities necessary toward ensuring that the desired future becomes reality. Personal futures planning calls on all its participants to work together as equal contributors in meeting the focus individual's needs and goals (O'Brien & Lovett).

MAPS (Making Action Plans) developed from efforts to assist families to include their children with disabilities in ordinary school classrooms (Pearpoint & Forest, 1997). MAPS brings together the key players in a child's life to identify a roadmap for working toward and achieving goals for the focus child (Forest & Lusthaus, 1989). The MAPS process identifies where the child currently is, what the goals are for the child, and how the team will work together to reach the goals. MAPS addresses the child's history, identity, strengths, gifts, and the team's dreams and nightmares for the child. The child's needs and actions steps for the plan are also identified. The MAPS process is most effective when the team has a general idea of what the goals are for the focus child (Kincaid & Fox, 2002).

PATH (Planning Alternative Tomorrows with Hope) is an effective process for bringing together a team that may already know a child well and has made a commitment to supporting the child in the future (Pearpoint & Forest, 1997). PATH is ideal for addressing short-term and long-term planning and achieving goals through achievable and measurable steps. As with most person-centered plans, the PATH process ensures that each team participant is assigned particular responsibilities for completing the identified action steps with the plan.

Essential lifestyle planning. Essential Lifestyle Planning developed from efforts to assist people to move from institutions into community agencies. The process focuses on gathering information about the focus person's core values, preferences, and nonnegotiables toward identifying the ideal match between the individual and a particular service agency (O'Brien & Lovett, 1997). Essential Lifestyle Planning also takes into account the person's disability and safety and health needs when developing a vision for the future and mobilizing and changing community services.

Each of the four approaches previously described share the common philosophical tenet of empowering individuals

with disabilities through the formation of powerful alliances with families, friends, and service providers. The person with disabilities is the focus of planning and, in conjunction with their significant others, considered the primary authority on their life. Furthermore, each approach to person-centered planning encourages people to appreciate the dignity of risk by trying new things in order to help the person with disabilities realize their desired future. Finally, each approach aims at changing the traditional landscape of the community (Smull, 1997) by confronting and reducing the segregation of, and congregation among, people with disabilities.

Conducting a Person-Centered Planning Meeting

Participants in a person-centered planning meeting search for a common vision of a desirable future with the focus person and identify ways to use their vision to guide everyday action (O'Brien & O'Brien, 2000). The person responsible for leading the development of this common vision is the meeting's facilitator. The facilitator leads the group through the planning process by setting the agenda, assessing equal opportunity for all to participate, handling conflict when necessary, and accurately recording the comments and process. This person should be a neutral, unbiased person. The facilitator should be someone who is familiar with the person-centered planning process. During the planning process, it is important that the facilitator be able to reflectively listen, and provide short feedback phrases.

Preparing the meeting. Before the meeting, the facilitator should ensure that the room is designed in way that is free of distractions and allows the participants to feel comfortable. Chairs should be arranged in a manner that encourages interaction among participants. O'Brien and O'Brien (2000) suggest that the facilitator post chart paper around the room so that notes can be recorded and viewed easily by the participants.

Design of the meeting. The facilitator should begin the meeting by orienting participants to the structure and purpose of the meeting as well as delineating the ground rules. Sample ground rules may include (O'Brien & Lovett, 1997): (1) the facilitator keeps the meeting on track and will adjourn at the agreed-upon time; (2) everyone should be an active listener and speaker; (3) avoid disrespectful behavior; (4) maintain an open mind toward unconventional methods for helping the focus person accomplish their goals; (5) disagreements are expected and will be addressed but will not be resolved at the meeting; and (6) reminding everyone that the meeting doesn't require anyone to do anything; instead, it offers an invitation for participants to commit themselves to supporting the accomplishment of the focus person.

Following the agenda. Once the preliminary steps of welcoming participants and establishing the ground rules are accomplished, the facilitator proceeds to the essence of the meeting by gathering information on the focus person's

goals for the future. All participants are asked to provide responses to the following commonly asked questions (O'Brien & Lovett, 1997; O'Brien & O'Brien, 2000): (1) what is the quality of the focus person's present life experiences?; (2) what is changing for the focus person, or in the surrounding environment, that is likely to influence the quality of the focus person's life?; (3) what are the most important threats to the person's quality of life?; (4) what is our image of a desirable future for the focal person?; (5) what are the most critical barriers to our moving toward the desirable future we've described?; (6) how will we most effectively manage these critical barriers and move toward the future we've defined?; and (7) what are the next steps?

Follow-up. Shortly after the meeting, all participants receive a written report that describes, in detail, the information gathered during the person-centered planning process. O'Brien and O'Brien (2000) recommend that, 2 weeks after the meeting, the people directly responsible for managing the person's schedule meet briefly to review the focus person's progress in light of the direction they set at the meeting. They consider the type, the number, and the balance of activities the person is involved in as well as the way the person presently performs the activities. One month after the meeting, the person who convened the planning process should review the commitments that were made during the "next steps" part of the meeting by either gathering the people who accepted responsibility for action or contacting each person individually (O'Brien & O'Brien). The purpose of this check-in is to share what has happened, what has been working well, and what needs improvement.

Conclusion

Person-centered planning enables individuals with disabilities to have a community presence and choice and influences change by creating a compelling image of a desirable future (Whitney-Thomas & Timmons, 1998). Those considered significant in the person's life are invited to join forces in helping him/her become successful. Finally, the planning process strengthens the person's alliances, clarifies individual interests and needs, and energizes new demands on the system and community (Smull, 1997).

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SELF-DETERMINATION

PERSON-FIRST LANGUAGE

Smart (2001) asserts that language is a mirror that reflects society's views toward certain groups, and the words that are used quite accurately reveal aspects of the social and cultural history of those groups. Many words exist that are demeaning, hurtful, and perpetuate negative stereotypes. The words traditionally used to describe individuals with disabilities have all too often been offensive and demeaning and used in a manner that has set these people apart from the broader society. Further, society's traditional use of language has lumped (Smart) all the people perceived to be in the group together regardless of individual differences. The labels used to describe people with disabilities

often describe only one aspect of an individual's identity (Rossides, 1990).

The language we use as a society can have tremendous influence in determining the level of access to, and participation in, job opportunities, educational opportunities, and social participation (Hahn, 1993). Before behavior and attitudes can be changed, language must be changed (Smart, 2001). The language used to describe disabilities and the people who experience disabilities has commonly communicated deficit and inferiority. However, with the passage of such legislation as the Americans with Disabilities Act of 1990 and the Individuals with Disabilities Education Act of 1997, the reductionist reference to people with cognitive, physical, and emotional challenges is beginning to fade (Bickford, 2004). In addition to innovative special education law, the inclusion movement has also sparked the onset of more proactive and positive perceptions of individuals with disabilities. The inclusion of students with disabilities has challenged teachers to embrace all students in a "person-first way" (Lieberman & Arndt, 2004). "Person-first" is a movement that advocates looking at individuals instead of differences. The language that is specific to this movement is referred to as "person-first language."

Person-First Language

Person-first language refers to the person first and the disability second. The guiding principle with this type of language is to speak in a manner that does not make people feel uncomfortable with disabilities (Garcia, 2003). The intent of person-first language is twofold: (1) to emphasize the person over his or her disability and (2) to promote individual abilities instead of disabilities. Many organizations and advocacy groups have demanded the use of person-first language (Lieberman & Arndt, 2004). In addition, the language is required in all publications of the American Psychological Association. The *Publication Manual of the American Psychological Association* (5th ed., 2001, p. 69) notes that "the guiding principles for 'nonhandicapping' language is to maintain the integrity of individuals and human beings. Avoid language that equates persons with their conditions."

General Guidelines for Disability Etiquette

In addition to following the practice of person-first language, research (Garcia, 2003; Lieberman & Arndt, 2004; Milington & Leierer, 1996; Student Council for Exceptional Children, 2001) suggests 10 common rules of etiquette that, when followed, enable individuals with disabilities to be treated with dignity, worth, and respect. First, when speaking or writing, remember that children and adults with disabilities are like everyone else, with the exception being that they have a disability. Emphasize the abilities of the individual rather than their limitations. Second, avoid patronizing individuals with disabilities and refrain from giving excessive praise or

attention to an individual with disabilities. Third, encourage an individual with disabilities to speak for himself or herself as often as possible. Fourth, remember that a “disability” is a functional limitation that interferes with a person’s ability to walk, hear, talk, and/or learn. The term “handicap” is often defined specifically as environmental obstacles imposed by society upon individuals, not as something intrinsic to the individual (Garcia, 2003). Fifth, use possessive language when referring to disabilities and assistive technology. Use the word “has” or “uses” instead of the word “is” or “confined” (e.g., Sally has autism, instead of Sally is autistic; Sam uses a wheelchair to navigate his environment, instead of Sam is confined to a wheelchair). However, individuals who are deaf, especially those in the Deaf Culture, prefer to be referred to as a “deaf person.” This is based on the deaf’s identity as a culture, as a group not unified by a disability, but rather, unified by shared experiences and a common language (Garcia). Sixth, be aware that special education is a service rather than a set of services. Special education is not a place. Seventh, always speak directly to the person with a disability, not to their companion, aide, or sign language interpreter. Eighth, keep the ramps clear and wheelchair-accessible doors unlocked. When talking to a person who uses a wheelchair, pull up a chair for yourself or stand at a slight distance so that they are not straining their neck to make eye contact with you. Ninth, people who are blind know how to orient themselves and get around. Identify yourself before a handshake and be sure to introduce them to others in the group so they are not excluded. If people who are blind or visually impaired regularly use your facility, inform them about any physical changes, such as rearranged furniture or equipment. Tenth, if the person has a guide dog, walk on the opposite side and remember not to make contact with the dog.

Table 1 provides a list of suggestions for the proper usage of person-first language.

Table 1

Say	In place of
Child with a disability	Disabled or handicapped child
Person with cerebral palsy	Palsied, CP, spastic
Person who has	Afflicted, suffers from, victim
Without speech, nonverbal	Mute, or dumb
Developmental delay	Slow
Emotional disorder or mental illness	Crazy or insane
Deaf or hearing impaired	Deaf and dumb
Uses a wheelchair	Confined to a wheelchair
Person with mental retardation; person with significant cognitive disabilities	Retarded
Has a learning disability	Is learning disabled
Nondisabled	Normal, healthy
Has a physical disability	Crippled
Congenital disability	Birth defect

Conclusion

Using person-first language is also an effective way to use communication as a tool for promoting self-determination in individuals with disabilities (Lynch, Thuli, & Groombridge, 1994; Smart, 2001). Person-first language is based on respect, dignity, and enabling individuals with disabilities to feel welcome. Finally, the words we use have the potential of fostering the full inclusion of individuals with disabilities throughout every fiber of their community. Language does, indeed, shape perceptions.

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PERSONNEL PREPARATION FOR WORKING WITH DIVERSE INDIVIDUALS

In contrast to the increasing number of students from diverse cultural and linguistic backgrounds, the teaching force is predominantly white, monolingual, female and suburban (Zeichner, 1993). The culture clash resulting from this disparity between the characteristics of students and those of

teachers is a contributing factor to the underachievement of culturally and linguistically diverse (CLD) students in both general and special education, with Hispanic/Latino, African American, and American Indian children and youth experiencing the most significant achievement difficulties. As a group, these students are disproportionately overrepresented in special education, underrepresented in gifted education, and have higher dropout rates when compared to their white counterparts (García & Dominguez, 1997).

Essential Knowledge and Skills Related to Diversity

Institutions of higher education must adopt training models that prepare special educators to be culturally and linguistically competent service providers. To effectively address the diverse backgrounds of the students in their classrooms, teachers must have both culture-general and culture-specific knowledge and skills. Culture-general knowledge emphasizes cultural phenomena that occur across cultures and that are widely applicable in a variety of settings (Brislin & Yoshida, 1994). This information provides the initial foundation for understanding cultural/linguistic factors in schooling and education. Culture-specific knowledge, on the other hand, provides an understanding of the customs, norms, traditions, and values of a specific racial/ethnic community and helps prepare teachers to better serve the communities in which they teach. In addition, there are several other essential components of culturally-responsive personnel preparation programs.

Cultural Self-Awareness

Cultural self-awareness serves as the foundation on which individuals build their knowledge and skills related to diversity (Brislin & Yoshida, 1994). Teachers of CLD students should have the opportunity to examine their own beliefs, attitudes, and assumptions related to individuals from culturally and linguistically diverse backgrounds. They must consider how current practices associated with labeling students (e.g., at-risk, disabled, low-performing) impact their own perceptions of, and expectations for, CLD students, and develop educationally valid perspectives that promote effective teaching practices (Cloud, 1993).

Cultural/Linguistic Knowledge

Educators must understand cultural/linguistic variables influencing the teaching-learning process at two levels. First, they must possess a foundation of culture-general knowledge such as cultural variations in childrearing practices, culturally-based learning and communication styles, acculturation, bilingualism, second language acquisition, and dialectal differences, as well as the influences of these on the teaching-learning process. Second, variations in these dimensions of human development and learning must be understood in relation to the specific ethnolinguistic com-

munities of their CLD students and families (Gay, 1993). Moreover, it is important for educators to know how to gather these culture-specific data in their school communities (Hollins, 1996), and to be able to incorporate what they have learned into their professional practice; i.e., design culturally/linguistically responsive curricula and instruction, conduct non-biased assessments, and communicate effectively with diverse families.

Culturally/Linguistically Responsive Practice

When students' background experiences are different from those expected by the school, it is important that educators design instructional programs that foster academic success as well as a positive, bicultural/bilingual identity (Cummins, 1986). Effective educational practices for CLD students include high expectations for all students, accepting and culturally pluralistic classroom and school environments, a culturally- and linguistically-inclusive curriculum, use of varied teaching and classroom management styles, teaching aimed at preventing academic failure, culturally-appropriate assessment procedures and materials, and support systems for teachers (Banks, 1990; Ortiz & Wilkinson, 1991). Special educators who serve CLD students with disabilities must also be able to design and implement individualized educational plans that are culturally and linguistically responsive (e.g., Franklin, 1992; García & Malkin, 1993). This includes the ability to provide special education services in the student's native language and/or English-as-a-second-language (ESL) instruction for students with disabilities who are also still in the process of acquiring English (Yates & Ortiz, 1998). Similarly, students who are nonstandard speakers of English need services that are responsive to their dialectal differences as well as which provide opportunities to acquire standard English. To do this effectively, professionals must be able to modify assessment, instruction, and related services to accommodate the intrapersonal interactions between culture, language, and disability (Cloud, 1993).

Collaboration

An integral aspect of a multicultural, pluralistic school is the development of collaborative partnerships between schools and families. Recognizing that schools and professionals have often interacted with families in ways that effectively discourage their participation (Harry, Allen, & McLaughlin, 1995), teacher education programs should foster pluralistic models of family involvement. Professionals must understand cultural variations in family structures and in views about disability, and the impact of these different perspectives on how families and individuals with disabilities interact with the educational system. They must be able to work with family members to build on their strengths and available resources (Ford, 1995; Harry, 1992).

Special educators must also be able to work collabora-

tively with bilingual education teachers, ESL teachers, general education teachers, paraprofessionals, assessment and related services personnel, and others involved in implementing the student's intervention plan. It is likely that CLD students with disabilities will be served simultaneously by special education and a variety of other programs, resulting in the need to coordinate selection and implementation of goals and objectives, including responsibility for meeting these goals, language(s) of instruction, as well as instructional materials and procedures used across programs.

Reflection and Problem-Solving

The process of designing culturally- and linguistically-responsive programs and services implies that teachers can evaluate available materials and resources, adapt them to be sensitive to individual students' educational needs, and determine when and whether modifications are required (Kennedy, as cited in Burstein, Cabello, & Hamann, 1993). This is achieved by developing teachers' self-reflection and problem-solving skills through field experiences, reflective logs, structured and guided discussions, and activities designed to apply classroom-based theoretical knowledge in field-based settings (Burstein, Cabello, & Hamann, 1993). Without such guided reflection, the educational value of practica and other field-based assignments may be minimal or detrimental (Zeichner, 1993).

Cultural Brokers and Change Agents

Finally, teachers must also be capable of functioning as change agents and as cultural brokers (Gay, 1993). They must take a leadership role in helping educational systems shift from a traditional deficit view of CLD students and communities to one which reflects acceptance of cultural and linguistic differences as assets (Obiakor & Utley, 1997). That is, they must have developed a sociopolitical or critical consciousness (Ladson-Billings, 1995) which promotes and supports changes at the institutional level (Gay, 1993). According to Gay, teachers must thus be reflective practitioners, adept at critically examining the nature of schooling, the culture of the dominant society, cultural similarities and differences, and potential sources of conflict or dissonance. They must understand the organizational culture of schooling and be able to employ effective strategies to foster student success, and to initiate and support change. Finally, they must have the requisite cross-cultural communication and counseling skills to be effective cultural brokers and change agents.

To achieve institutional change in practices affecting CLD learners, general and special educators must additionally (a) understand the historical and contemporary factors which have led to disproportionate representation of CLD students in special and gifted education; (b) develop problem solving processes to systematically eliminate school-related factors which have contributed to the underachievement

of CLD students (García & Ortiz, 1988); and (c) critically examine assessment and identification procedures (Cummins, 1986) as well as programs and services to ensure that they are effectively meeting the educational needs of CLD students.

Related Issues

Many special education programs which serve CLD students are staffed by professionals who are not adequately trained and who are acquiring their expertise on the job. While efforts are underway to increase the number of CLD teachers who enter and remain in the profession, experience suggests that these efforts will not be sufficient to meet the needs of a growing CLD student population (Hill, Carjuzza, Aramburo, & Baca, 1993). Competencies must be identified and programs developed at the preservice and inservice levels to prepare all teachers to better serve the needs of culturally and linguistically diverse learners to reduce or eliminate the continuing cultural clashes resulting from the discontinuities between teachers' and students' backgrounds. In addition, institutions of higher education as well as school systems must continue to explore alternative approaches for recruitment and retention of professionals committed to working with CLD populations.

Contributing to the shortage of special education teachers with skills and competencies to serve CLD students is the serious shortage of university faculty who themselves have expertise related to CLD students with disabilities. This is a critical issue in that higher education faculty play a central role in the creation of new knowledge relative to the education of language minority students. Of particular concern, then, is the serious shortage of researchers from CLD backgrounds. Attention must be given to the retooling of university faculty to participate in the preparation of teachers for an increasingly pluralistic society. The special education literature on the preparation of teachers and other professionals to serve CLD populations is quite limited (Tulbert, Sindelar, Correa, & LaPorte, 1996), and studies of effective practices or program designs for diversity training in special education are even more scarce (Artiles & Trent, 1997). Several issues surround the question of how best to prepare professionals in general and special education to meet the needs of an increasingly diverse student population. Questions which must be addressed by future research in teacher education include:

- What competencies are needed by all educators who serve CLD exceptional learners?
- What is the role of bilingual/multicultural special education specialists in services for CLD exceptional children and youth?
- What are essential professional competencies related to diversity that produced high student outcomes for CLD exceptional learners?

What is the most effective program design for multicultural/bilingual special education?

How does program philosophy and design (e.g., inclusion vs. specialized courses) influence the quality of the teachers' learning?

Professional Standards

There are several efforts underway aimed at identifying essential knowledge and skills of novice and exemplary teachers. For example, the Council for Exceptional Children has developed professional standards for the preparation of special educators (Council for Exceptional Children, 1996) and is currently collaborating with its Division for Culturally and Linguistically Diverse Exceptional Learners to identify entry-level knowledge and skills associated with teaching CLD students. Similarly, the National Board for Professional Teaching Standards is preparing standards for what accomplished special education teachers should know and be able to do, and has designed a system for recognizing exemplary teachers of special needs students. All Board certificates include equity, fairness, and diversity standards which underscore the importance of respecting and responding to individual and group differences and of ensuring that all students have access to academically challenging curricula and opportunities to learn.

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PERSONNEL TRAINING IN SPECIAL EDUCATION

See SPECIAL EDUCATION, TEACHER TRAINING IN.

PERU, SPECIAL EDUCATION IN

Special education services became established within the Ministry of Education following the passage of Educational Reform in 1971 (Legislative Decree No. 19326). These services currently are supported under the General Law of Education No. 23384, and the Regulation of Special Education D.S. No. 02-83-ED. Various special education programs are offered to students ages 0 through 20, including early intervention, elementary education, special primary education, and vocational education. Special education offers services principally to students with hearing and visual impairment, mental retardation, and those who are highly gifted. Services for those with impairments typically include language or physical therapy, promotion of psychomotor or social skills, and meetings/workshops to train parents of students with these disabilities (Benites, 2003).

Students with special educational needs who are integrated into regular schools are supported by Educational Centers through the Diversity Service Offices (*Servicio de Atención a la Diversidad*), which provide specialized resource to families, regular schools, and the community. Special education services are based on the key principles of inclusion, normalization, individualization, community integration, and provision of services in regional sectors (Ministry of Education, 2005).

In 2000, there were 397 special education centers in Peru, 92 percent of which were located in urban areas (Ministry of Education, 2000). These centers served 28,369 students (accounting for 0.4 percent of the Peruvian school population), 45 percent of whom live in Lima. They mainly served the needs of students with mental retardation (81 percent), those who were deaf or hard of hearing (10 percent), who were physically impaired (4 percent), were blind or visually impaired (4 percent), had a language disorder (1 percent), or displayed a behavior problem (1 percent; Ministry of Education, 2004). Practitioners serving these children include teachers, (56 percent), auxiliary employees (15 percent), specialists in mental retardation (9 percent), psychologists (6 percent), hearing and language specialists (4 percent), specialists for the visually impaired (2 percent), social assistants (3 percent), and physical therapists (2 percent). Thirty-eight percent of the centers have language therapy classrooms, 35 percent have physical therapy classrooms, 33 percent have early stimulation classrooms, and 17 percent have rooms for psychological services.

Both inclusive public and private schools are located in the various Local Educational Management Units through-

out Peru. There are 120 inclusive schools in Lima, and 13 in Callao (Benites, 2003). Current priorities include improving special education services. In addition, efforts are needed to inform classmates and other peers as well as parents and other adults of characteristics of exceptional students, with the goal to promote understanding and prevent discrimination and, even more, to prevent physical and psychological mistreatment (Ministerio de Educación de Perú y Organización de Estados Iberoamericanos, 1994).

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PESTALOZZI, JOHANN HEINRICH (1746–1827)

Johann Heinrich Pestalozzi, a Swiss educator, greatly influenced education in Europe and the United States. Believing that ideas have meaning only as related to concrete things and that learning must therefore proceed from the concrete to the abstract, he developed a system of education through object lessons that were designed to help the child develop abstract concepts from concrete experience.

Pestalozzi operated a number of orphanages and schools, the most notable being his boarding school at Yverdon, founded in 1805. His school demonstrated concepts such as readiness, individual differences, ability grouping, and group instruction, and contributed to the inclusion in the curriculum of the practical subjects of geography, nature, art, music, and manual training. Large numbers of educators visited Yverdon and hundreds of Pestalozzian schools were established in Europe. Pestalozzi's object method was first used in the United States in the schools of Oswego, New York; the Oswego Normal School trained teachers in Pestalozzi's methods. Of his numerous publications, Pestalozzi's *How Gertrude Teaches Her Children* best sets forth his educational principles.

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PETS IN SPECIAL EDUCATION

Animals have long been used in classrooms throughout the world (Hulme, 1995). The classic goldfish and gerbils have been used to teach basic animal facts. Teachers have also used pets to foster responsibility in their students. Animals can provide valuable classroom or instructional assistance far beyond the traditional expectations. Sustenance instruction, responsible behavior training, and abstract concepts development can be enhanced by involving special education students with animals. These animals may be provided in the classroom or they may be pets from home.

Any pet (fish, dog, cat, bird, etc.) may be used for sustenance instruction. Special education students can better learn the basic needs of animals through active participation in the pet's care. The students identify the need for food, water, shelter, and love. Instruction may include concepts such as appropriate food for different species, appropriate quantities of food and water, how climate affects the need for shelter, and how animals exhibit and respond to affection.

Teaching responsibility is a multifaceted, often difficult task. Whenever special education students have the responsibility for pets in the classroom or at home, the teacher should be attempting to develop various components of responsible behavior. Students should learn to create feeding, watering, bathing, walking, etc., schedules. In creating schedules for their pets, students may learn to develop

schedules for their own lives. Caring for pets also aids in developing task commitment, as well as relationship commitment. Another facet of responsibility, self-initiation, is readily taught when students must care, without reminders from the teacher, for classroom animals.

Students may also develop observation skills through involvement with pets. Because pets are basically nonverbal, students must watch for changes in the animals' appearance or mannerisms to detect illness or injury.

Many special education students have difficulty in understanding abstract concepts such as life, death, and love. The birth or death of a classroom pet may be used to teach the rudiments and sentiments of such abstract concepts. The emotions of love, caring, and affection may be developed or more objectively understood by special education students when pets are used.

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EQUINE THERAPY RECREATION, THERAPEUTIC

PEVZNER, MARIA SEMENOVNA (1901–1986)

As a physician-psychiatrist and doctor of pedagogical sciences, Maria Pevzner is known for her work on oligophrenia (mental deficiency). Her research was concentrated in the areas of child psychopathology and clinical assessment of atypical children. She suggested classification of oligophrenics into five groups: (1) with diffuse maldevelopment of the cortical hemispheres without serious neurological implications; (2) with cortical deficits and impaired perceptual abilities; (3) with various sensory, perceptual, and motor deficits; (4) with psychopathological behavior; and (5) with maldevelopment of the frontal lobes (Pevzner, 1970). Pevzner has extensively studied the criteria and clinical aspects necessary for a diagnosis of oligophrenia in school-age children (Mastyukova, Pevzner, & Peresleni, 1986), and she and her colleagues also investigated the intellectual development of children with cerebral palsy, finding considerable variation in intellectual disorders, thus suggesting the benefit of comprehensive examination for these children (Mastyukova, Pevzner, & Peresleni, 1987, 1988). Well-known publications of Pevzner are *Children Psychopaths* (1941), *Developmental Assessment and Education of Oligophrenic Children* (1963), and *Children with Atypical Development* (1966).

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PHENOBARBITAL

Of the many available anticonvulsant medications, phenobarbital is the least expensive, most effective, best known, and most widely used barbiturate. It is the drug of choice for tonic-clonic (grand mal) epilepsy, neonatal fits, and febrile convulsions (Maheshwari, 1981), and may be viewed as the drug of choice for childhood epilepsy except in cases of absence (petit mal) attacks (Swanson, 1979). It even may be used as an effective agent in pure petit mal epilepsy as a measure against the development of grand mal epilepsy (Livingston, Pruce, & Pauli, 1979).

All anticonvulsant medications have side effects and the extent and severity of such side effects often influence medication choice. Unlike many anticonvulsant drugs, phenobarbital has few somatic side effects; however, it appears to have more pronounced effects on mental or cognitive functions in children (National Institutes of Health, 1980). Sedation or drowsiness is the chief side effect of phenobarbital in children. This initial effect of mental slowing is most pronounced when the drug is first administered. The effect generally declines within several weeks (Livingston, Pauli, Pruce, & Kramer, 1980; Schain, 1979) and appears to be dose related (Livingston et al., 1980; Livingston, Pruce, Pauli, & Livingston, 1979; Swanson, 1979; Wolf, 1979). Common behavioral side effects include hyperactivity, extreme irritability, and aggression (Fishman, 1979;

Livingston et al., 1980; Nelson, 1983; Wilensky, Ojemann, Temkin, Troupin, & Dodrill, 1981). Other side effects involving cognitive or higher cortical functions include impaired attention, short-term memory deficits, defects in general comprehension, dysarthria, ataxia, and, in some cases, poor language development (Levenstein, 1984; Shinnar & Kang, 1994).

Fortunately, the side effects do not appear to be permanent, and withdrawal or replacement with other medications often produces significant amelioration of these deficits. For example, withdrawal may lead to dramatic improvements in personality patterns and learning skills (Schain, 1979). Continuous monitoring of possible side effects and appropriate adjustment of anticonvulsant medication is therefore of the utmost importance in effective management of seizure disorders.

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ABSENCE SEIZURES
ANTICONSULSANTS
MEDICAL MANAGEMENT
SEIZURE DISORDERS

PHENOTHIAZINES

Phenothiazine is the class of drugs that historically was most often prescribed in the treatment of psychotic disorders, until the late 1990s and the advent of new atypical antipsychotics such as Risperidone and Seroquel. This class of medications, which provides symptomatic relief from many of the disturbing symptoms of disorders like schizophrenia and borderline personality disorder in males (Andrulonis, 1991), replaced the more radical methods of symptom control (e.g., psychosurgery). In addition, the significant behavioral changes that occur when medication regimens are optimally effective allow patients to be treated in outpatient clinics rather than be chronically hospitalized. There are three major classes of phenothiazines that are relatively similar in their overall actions but different in their dose/response ratios and the overall amount of sedation produced (Bassuk & Schoonover, 1977). The subgroups include

Aliphatic	
Chlorpromazine	(Thorazine)
Promazine	(Sparine)
Piperidine	
Thioridazine	(Mellaril)
Piperacetazine	(Quide)
Mesoridazine	(Serentil)
Piperazine	
Trifluoperazine	(Stelazine)
Perphenazine	(Trilafon)
Fluphenazine	(Prolixin)

The major criticisms of phenothiazines revolve around the exclusive, long-term use of these drugs to control observable symptoms without an attempt to deal with etiology or overall adaptiveness (Marholin & Phillips, 1976). Crane (1973) provides an additional criticism indicating that phenothiazines also have been used within long-term treatment centers to control reactions to institutionalization and enforced restrictions: i.e., punitively.

Phenothiazines produce side effects that may be grouped into four classes: involuntary muscular contractions, especially in the area of the face; motor restlessness; parkinsonlike symptoms such as rigidity, motor slowing, excess salivation, slurred speech, flat facial expression, and gait disturbance; and tardive dyskinesia, a syndrome that consists of stereotyped, repetitive involuntary movements

and persists even after medication is discontinued (Bassuk & Schoonover, 1977). Side effects in children are similar to those of adults; however, parents additionally should be aware of sun sensitivity, when children are outside for extended periods of time, and learning/concentration difficulties, especially during onset of treatment (Bassuk & Schoonover).

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PHENYLKETONURIA

Phenylketonuria (PKU) was one of the earliest biochemical irregularities associated with mental retardation. Folling noted in 1934 that a few institutionalized retardates had urine with a peculiar “mousy” odor, which was found to arise from the excretion of phenylacetic acid. Classic PKU results from the absence of the enzyme phenylalanine hydroxylase, which normally converts phenylalanine, an essential amino acid common to most proteins and many other foods, into tyrosine and its constituent components. The resulting high levels of phenylalanine damage developing brain tissue. Since brain damage is irreversible, permanent and severe retardation is a predictable outcome, as are seizures, tremors, and hypopigmentation of skin (Smith, 1985).

An autosomal recessive inborn error of amino-acid metabolism, PKU is expressed only in those homozygotic for the defective gene. Incidence is about 1 in 10,000 births in Whites and Asians, but much lower in Blacks. Heterozygotes typically produce enough enzymes for normal metabolism. Affected homozygotes are usually normal at birth since prenatally they received already metabolized nutrients through the umbilical cord. If the disorder is undiagnosed and untreated, progressive brain damage begins. Until the

1950s, prognosis was poor; most affected individuals had IQs of about 30 and were institutionalized.

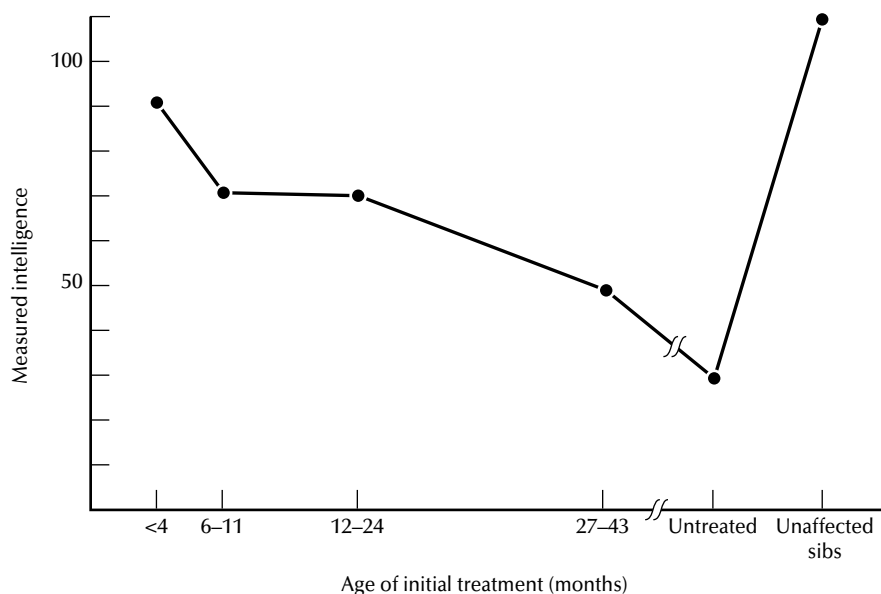
Neonatal screening is now universal. Although a urine test was originally used, diagnosis is now through the Guthrie test, which reveals excess phenylalanine through a blood test 24 to 48 hours after birth. If PKU is diagnosed, the infant is placed on a low phenylalanine diet, which is synthetic because of the ubiquitous presence of phenylalanine in protein. Dietary treatment must begin within a few days of birth for maximal effectiveness. Adult IQ of early treated PKU individuals is about 90; IQ becomes lower with delay of treatment so that by about 3 years of age, maximal damage has occurred. The diet is the sole nutrient fed in infancy. Some (e.g., Berkow, 1977) suggest that thereafter low-protein foods such as fruits and vegetables may be tolerated, whereas others (e.g., Smith, 1985) recommend strict adherence to the diet. The taste of the diet is aversive, and maintaining the child on it while the rest of the family eats regular food can be an increasingly serious problem as the child grows.

Since phenylalanine is toxic only to developing brain tissue, treatment can cease or be relaxed when brain development is complete. Authorities disagree on when the diet can be terminated, but common practice has been to return the child to normal food at about age eight. However, research suggests that longer dietary treatment may be advisable. Dietary treatment for PKU is a classic example of genetic-environmental interaction. On a normal diet, individuals with PKU genotype will develop phenotypic IQ of about 30; dietary intervention alters the predicted developmental pathway, resulting in nearly normal phenotypic IQ (Brown, 1986).

However, treated PKU children may show specific deficits in perceptual motor functioning and arithmetic achieve-

ments that are more serious than would be expected on the basis of their slightly below average IQs. They appear to have neuropsychological deficits similar to those of brain-damaged children (Brunner, Jordon, & Berry, 1983; Pennington, von Doorninck, McCabe, & McCabe, 1985), and have particular deficits in visuospatial and conceptual skills, which may partially account for their problems with mathematics. Pennington et al. (1985) suggest that the deficits may occur because the children are taken off of the diet before the completion of relevant brain development. Although the number of subjects in these studies was small and the findings need confirmation, those working with treated PKU children should be aware that such children may have some specific learning deficits.

The effectiveness of the diet has had one tragic and unexpected effect. In the late 1960s, it became clear that children born to PKU women who had eaten normal food during pregnancy suffered prenatal growth retardation, microcephaly, and brain damage, even though the children did not have the PKU genotype. Although the effects were variable, many of the children died early or became severely retarded. The problems may have been more serious than in untreated PKU itself (Lenke & Levy, 1980). The pregnant women had transmitted unmetabolized phenylalanine to their embryos and fetuses at the prenatal critical period for adverse influences on brain development. A common recommendation now is for PKU women to return to the diet throughout the time they may become pregnant. But regulation of optimal phenylalanine levels is difficult, and no dietary program is completely effective. The safest recommendation is for PKU women not to have children. Thus treated women have an additional responsibility during childbearing years, and some who are at a marginal level of functioning may need some social service assistance (Brown, 1986).



Mean IQ of PKU children as a function of the age at which dietary treatment

Recent research has changed previous recommendations that children with PKU could discontinue the special diet at about 8 years. Early-treated children who stop the diet actually show deterioration in functioning (IQ, reading and spelling, social behavior). Further, children on the diet show deficits in short-term memory and “executive functioning” relative to nondisabled children. Some studies suggest that children with PKU who are on the diet still have higher levels of phenylalanine relative to tyrosine in their brains than do normal children. Tyrosine is a precursor to dopamine, a main neurotransmitter in frontal lobe functioning, and some of the problems shown by children with PKU who are on the diet resemble those associated with frontal-lobe syndrome. Thus, life-long dietary treatment is now recommended, and even then, some specific deficits in functioning are likely. Some of this information can be found in Batshaw (1997).

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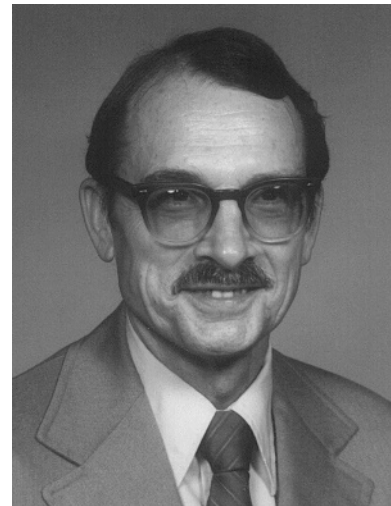
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BIOCHEMICAL IRREGULARITIES INBORN ERRORS OF METABOLISM

PHILLIPS, BEEMAN N. (1927–)

A mathematics and physics major, Beeman N. Phillips completed his BA degree at Evansville College in 1949. He pursued graduate training at Indiana University, earning both



Beeman N. Phillips

his MS, in 1950, and EdD, in 1954, in educational psychology. Immediately following the completion of his doctoral degree, Phillips served as director of the Division of Research of the Indiana State Department of Public Instruction. In 1956 Phillips joined the faculty of the Department of Educational Psychology at the University of Texas, Austin, where he has remained.

At the University of Texas, Austin, Phillips founded one of the first doctoral training programs in school psychology, a program considered by many in the field to be the leading program in the country. Though its focus has changed in recent years, the program was particularly successful in pioneering and promoting consultation models for indirect service delivery in the provision of school psychological services. As the director and only continuous faculty member of the program, Phillips has been a key element in the development of the profession of school psychology. Among other professional leadership roles, Phillips has served as president of the Division of School Psychology of the American Psychological Association and was the editor of the *Journal of School Psychology* from 1972 to 1980. In 1978 Phillips was given the Division of School Psychology Distinguished Service Award. He was also the recipient of the 1991 Outstanding Education Alumnus Award from the School of Education, Indiana University (Bloomington), and in 1992 received the first annual Dean's Distinguished Faculty Award in the College of Education from the University of Texas at Austin. In June, 1998 he became professor emeritus.

Applied educational and psychological research has been the consistent focus of Phillips' research program. He has also been concerned with developing conceptual and methodological rigor in school psychological research, the latter perhaps best exemplified in his chapters in the *Handbook of School Psychology*. As a major research interest, Phillips has studied school stress and its relationship to school

adjustment and learning. His work as a whole reflects a strong educational orientation to psychological research coupled with a concern for theoretical relevance and practical applications of research. He has emphasized the need for a better interface between psychology and schooling as well as the means for achieving it. Phillips's books include *School Psychology at a Turning Point: Ensuring a Bright Future for the Profession* (1990) and *Educational and Psychological Perspectives on Stress in Students, Teachers, and Parents* (1993).

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- to which children have a right to education and whether all children can benefit from instruction. Questions of access and educability were first raised with respect to individuals with severe and obvious disabilities—the blind, deaf, mentally retarded, and seriously emotionally disturbed. Concern for these individuals prompted the earliest intervention efforts, beginning in the United States as early as 1817. The achievements of educators such as Edouard Seguin gave rise to optimism that education could cure or ameliorate severe handicapping conditions and resulted in an expansion in the number of available treatment programs for these populations (Kauffman, 1981).
- The enactment of compulsory school attendance laws in the early twentieth century brought a wider range of students to the public schools. As a result, the special educational needs of students became apparent. Special classes were instituted, providing these students with some measure of access to education, but few programs were designed to deliver the type of instructional program necessary to ensure that these students could profit from their schooling. (See Kauffman, 1981, Reynolds & Birch, 1982, for a detailed chronology of major historical influences in special education.)
- The beginnings of the civil rights movement in the 1950s set the stage for further changes in philosophies of educational access. Equal educational opportunity became a focus for the efforts of increasingly active parent groups and professionals in special education. A body of case law, beginning with the *Brown v. Board of Education* decision, eventually developed and affirmed the principle of children with disabilities' right to education.
- The question of what organizational setting, or placement, is most appropriate for students with disabilities has been answered differently through the history of special education. Beginning with residential institutions, the range of placement options has gradually increased to include special schools, special classes within public schools, and, finally, integration into regular public school classes (mainstreaming) and inclusion. IDEA requires that students with disabilities be placed, to the maximum extent appropriate, in regular educational environments with their nondisabled peers. This mandate is known as placement in the least restrictive environment. Inclusion and least restrictive placement are outgrowths of the broader philosophical concept of normalization—the belief that persons with disabilities should, to the greatest extent possible, be integrated into society.
- Without appropriate instructional strategies, any inclusive or least restrictive placement efforts are unlikely to succeed. Individualized instruction, first advocated by nineteenth-century educators such as Itard and Seguin, has been formalized through IDEA's requirement that an individualized education program be developed and its execution monitored for each child placed in special education.
- The philosophical issues that have shaped special education have evolved and changed significantly over the past

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PHILOSOPHY OF EDUCATION FOR INDIVIDUALS WITH DISABILITIES

The philosophical beliefs and values that underlie special education are diverse, dynamic, and interrelated. They reflect broad social issues such as attitudes toward individuals with disabilities as well as specific educational concerns. Three key issues are access to education, placement, and instruction.

Issues of access to education involve questions relating

two centuries. A contemporary philosophy of education for the individuals with disabilities incorporates a diversity of complex issues that include those related to access to education, educability, placement, and instruction.

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PHOBIAS AND FEARS

Fear in children and youths is a very strong emotion and is associated with behavioral, cognitive, and physiological indicators of anxiety. When a child or youth with disabilities experiences fear that is not age-related in a setting where there is no obvious external danger, the fear is irrational, and the person is said to have a phobia. When the person begins to avoid the nondangerous feared situation, even while maintaining that such action is foolish, the phobia is commonly referred to as a phobic reaction (Morris & Kratochwill, 1983). Fear, on the other hand, is an integral part of normal child development. Many children's fears are transitory, appear in children of similar age, and generally do not interfere with everyday functioning. In fact, some fears that occur during development provide children with a means of adapting to various life stressors.

Those fears observed in infancy typically occur as a reaction to something taking place in the child's environment (e.g., the presence of strangers or loud noises). As the child grows into the toddler and preschool years, the fears broaden and involve the dark, ghosts and other supernatural figures, parent separation, and fears of particular events, objects, or persons. With growth in to the early to middle school years, developmental fears continue to broaden and include such

stimuli as animals, thunder and lightning, the dark, parent separation, bodily injury, and sleeping alone. As the child enters preadolescence and adolescence, the normative fears turn more toward school performance, physical appearance, bodily injury, peer acceptance, death, and imaginary figures (Morris & Kratochwill, 1983).

Separating the meaning of fear from the meaning of phobia has been discussed by Marks (1969). He suggests that phobia is a subcategory of fear that "(1) is out of proportion to the demands of the situation, (2) cannot be explained or reasoned away, (3) is beyond voluntary control, and (4) leads to avoidance of the feared situations" (p. 3). In addition, Miller, Barrett, and Hampe (1974) have stated that a phobia "persists over an extended period of time . . . is unadaptive . . . [and] is not age or stage specific" (p. 90).

Although a fair amount of research has been conducted on the incidence and prevalence of children's fears, less research has been published on children's phobias. Miller et al. (1974), for example, report that the incidence of intense fears (phobias) was about 5 percent of their sample of 7- to 12-year-old children. Similarly, Marks (1969) reported that the percentage of children having phobias who were referred to a British clinic was only 4 percent. Other studies estimated the prevalence of phobias among children to be less than 8 percent of the number of child referrals to a clinic or in the general child population.

With respect to developmental or normative fears, studies have shown that young children, 24 to 71 months of age, experience on the average 4.6 fears (Jersild & Holmes, 1935). Forty-three percent of children who are 6 to 12 years of age experience at least seven or more fears (Lapouse & Monk, 1959). In preadolescent and adolescent youths, 66 percent of those sampled reported fears of violence (Orton, 1982). Although girls tend to be more fearful than boys in the early years, this difference does not seem to appear on a regular basis in pre- and early adolescence. No literature exists on the incidence or prevalence of phobias and fears in children and youths with disabilities.

Numerous studies have been published over the past several years on intervention approaches for reducing fears and phobias. The assumptions underlying these approaches have generally followed a behavioral orientation. There are five major behavior therapy approaches for fear or phobia reduction in children and youths: systematic desensitization (including variations of this procedure); flooding-related therapies; contingency management procedures; modeling; and self-control procedures. Of these methods, the one that has been used primarily in research is systematic desensitization or variations of this method. Although there are many studies on fears and phobias available for study, with regard to children and youths with disabilities, few research studies have been published on the treatment of fears and phobias; however, of those studies that have been published, the majority have used a procedure that is based on systematic desensitization.

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ANXIETY DISORDERS EMOTIONAL DISORDERS

PHONOLOGICAL AWARENESS TEST

The Phonological Awareness Test (PAT) is an extension of the Phonological Awareness Profile, which was first published in 1995. The profile proved useful in planning instruction; however, users of the profile hoped for a standardized version of the assessment. Thus, the authors developed the PAT. This test was designed to assess students' awareness of the oral language segments that make up words. It comprises four sections:

1. *Rhyming*: Discrimination—identify rhyming words presented in pairs; Production—provide a rhyming word given a stimulus word.
2. *Deletion*: Compounds and syllables—say a word and say it again deleting a root word or syllable; Phonemes—say a word and say it again deleting a phoneme.
3. *Substitution*: With Manipulatives—using colored blocks, isolate a phoneme, then change it to another phoneme to form a new word; Without Manipulatives— isolate a sound in a word, then change it to another sound to form a new word.
4. *Isolation*: Final—identifies final phoneme in a word; Medial—identifies medial phoneme in a word.

The PAT provides opportunities for analysis of student performance on each subtest. Performance can be classified according to four developmental levels: word, syllable, phoneme, and grapheme. Depending on student performance on the PAT, sample activities for instruction are presented to increase students' sound awareness. The manual recommends beginning instruction at the earliest level in which the student demonstrates difficulty. The Phonological Awareness Kit and the Phonological Awareness Kit—Intermediate provide a program of activities for each level of phonological awareness and phoneme-grapheme correspondence. The manual specifies that this test should be administered by a professional trained in analyzing the phonological structure of speech. It further indicates that it is unlikely that support personnel or paraprofessionals can adequately administer, interpret, and score the test.

The PAT was standardized from September to November 1996 on a sample of 1,235 students from five U.S. states.

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PHONOLOGY

Phonology is a study of the rule-based system underlying phoneme development and speech production. The focus is not on the emergence of specific phonemes but rather on sound classes such as stridency and nasality. The organizational schemata for the formation and use of the phoneme system is the focus of attention.

The need to convey meaning drives this system. At first, children may have only gross classifications like consonant versus vowel as tools to communicate. To get their needs met, they learn that words need beginnings and ends and that there are classes of sounds like stops and front sounds. They acquire the global classes and gradually refine within those classes to ultimately differentiate between a /t/ and a /k/. Children's productions, at any point in time, may be transcribed, analyzed and the rules written to describe the strategies they are using to articulate.

Phonological maturation information exists, but it relates to phonological process usage, the rule-bound simplification and (at times) complication strategies children use to produce speech. In contrast to articulation, the developmental data for phonological maturation is not when sound classes emerge but rather when the processes cease to operate. As children's oral motor, sensory, and discrimination skills develop and their knowledge about combining phonemes into words and larger units of speech increases, process usage decreases. Eighteen-month-old children are likely to know

that words need a beginning sound but they are unlikely to use word final consonants. Thus, they exhibit the process *final consonant deletion*. This process typically drops out by the time a child is three. Higher level processes such as stopping and stridency deletion drop out much later in normal developing children (Grunwell, 1987).

Children with phonological disorders have difficulty abstracting the rules for articulation from the input they hear from others. Their speech is generally unintelligible. The number of phonemes in error will be in excess of 10, and the errors will have a rule-based pattern. Children with phonological disorders generally use the same processes that younger, normal-developing children use, but they have more processes functioning and tend to maintain them longer (Ingram, 1976). In evaluating the severity of the disorder, two considerations are the age of the child and the number of processes being used. In addition, if there are vowel errors, a more complex disorder is signaled because vowels emerge very early in speech production. Similarly, if a child has truly been taught to self-evaluate and does not do so after a reasonable amount of time, it may be the first indicator of an accompanying auditory processing difficulty. Most children with phonological process disorders are normal developing children with intact systems who for no known reason are having trouble with the organizational structure of speech production. The prognosis for this latter group is very good. Children with auditory processing deficits and those with motor/neurological involvement also benefit from phonological process treatment but progress more slowly.

Prior to treatment, an extensive speech analysis is needed to determine the rules being applied and the extent of process usage. Treatment focuses on providing children with information that assists them in revising the rules they are using for speech production. For example, they are taught that most words must have endings and that any consonantal ending is acceptable. They are reinforced for putting on any end. Once endings emerge, refinement of the process may begin. They may be then told that for these particular words, a ending is still needed but it has to be a stop. As the child progresses, finer and finer distinctions are made. Treatment moves from global to specific. Geirut, Elbert, and Dinnsen (1987) report that the more children are taught what they do not know, the quicker generalization will occur throughout the sound system. Gierut advocates the use of maximal oppositions in treatment; contrasting two phonemes representing processes the child does not know (Gierut, 1989). Sound classes are taught on a cognitive level by modeling and labeling, having the youngster produce exemplars representative of the class, and then having them self-evaluate whether they produced, for example, a strident.

Phonological processes are most frequently discussed relative to developing rule systems, typically that of children. Older individuals with mental retardation or neurological

involvement which presents as apraxia and/or dysarthria also benefit from process-based treatment. The person with retardation may not have mastered the rule-based system for speech. Focus on low level processes like ends-on-words, syllableness, front and back sounds, and others produces gains in intelligibility. Adults with dysarthria and apraxia have previously learned the rules for speech production but due to neurological insult, now have difficulty executing or planning movements. Broader-based treatment which organizes speech by category, assists these persons in improving their speech. For example, if a patient is substituting one sound for another, in-class substitutions will produce greater intelligibility than those which are out-of-class. Thus, the applicability of phonological process treatment is broad and not limited solely to young children.

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LINGUISTIC READERS READING DISORDERS READING REMEDIATION

PHOTO ARTICULATION TEST—THIRD EDITION

The Photo Articulation Test—Third Edition (PAT-3; Lippke, Dickey, Selmar, & Soder, 1997) is a completely revised edition of the Photo Articulation Test. It is a standardized way to document the presence of articulation errors. The PAT-3 enables the clinician to rapidly and accurately assess and interpret articulation errors. The test consists of 72 color photographs (9 photos on each of eight sheets). The first 69 photos test consonants and all but one vowel and one diphthong. The remaining 3 pictures measure connected speech and the remaining vowel and diphthong. Consonant sounds are differentiated into the initial, medial, and final positions within the stimulus words. A deck of the same 72 color photographs, each on a separate card, is provided for further diagnosis and may be used in speech-language remediation.

The PAT-3 was standardized in a 23-state sample of more than 800 public and private school students in pre-kindergarten through grade 4. The students have the same characteristics as those reported in the 1990 Statistical Abstract of the United States. Percentiles, standard scores (mean = 100, SD = 15), and age equivalents are provided. Internal consistency, test-retest, and interscorer reliability coefficients approximate .80 at most ages, and many are in the .90s. Information is provided for content, criterion-related, and construct validity.

Earlier editions of the PAT were reviewed; references for the newest edition of the instrument are unavailable because of its recent publication date. Shriberg (1978) reviewed the PAT and reported that the one feature that distinguished the PAT from other commercially available three-position tests is that children do respond readily to the photographs.

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PHYSICAL ANOMALIES

A physical anomaly is any bodily attribute that deviates significantly from normal variation. Technically, physical anomalies need not be disabling or handicapping though, as will be noted, they often occur concomitant to a variety of handicapping conditions. For instance, prematurely gray-haired individuals exhibit a physical anomaly, yet, the anomaly is unlikely to be viewed as an impairment (i.e., a disability). It is also unlikely to serve as a disadvantage that makes achievement in particular circumstances exceptionally difficult (i.e., a handicap).

Special educators are most directly concerned with physical anomalies that limit an individual's success in typical life activities (e.g., occupational, familial, and social activities). Such physical anomalies may be found in virtually all of the traditional exceptionalities. However, they are most clearly apparent in the following categories: visual, hearing, and physical handicaps, health problems, and mental retardation.

Physical anomalies can impose handicaps in one or many important domains (e.g., cognition, affect, and motor). Functionally, the individual may have difficulty in academic achievement (e.g., reading, mathematics), in social/emotional adjustment (e.g., making and sustaining friendships,

attaining a positive self-concept), and in physical activities (e.g., locomotion, orientation).

Visual anomalies, depending on the age at onset, may be classified as congenital (present at birth) or adventitious (acquired sometime after birth). Generally, the impairment concerns visual acuity, field of vision, ocular motility, accommodation, color vision, or corneal opacity.

Like visual anomalies, hearing problems may be classified in different ways. For instance, classification may depend on age of onset (congenital vs. adventitious). Distinctions are also based on the degree of hearing loss (i.e., deaf or hard of hearing). Finally, hearing problems may be conductive or sensorineural in nature. A conductive hearing loss results from interference with the physical transmission of sound waves from the outer ear to the inner ear. On the other hand, a sensorineural hearing loss, as suggested by the name, is caused by neurological damage to nerve tissue in the inner ear. Sound may be grossly distorted to the listener or may not be transmitted at all. In general, sensorineural hearing losses have the more pessimistic prognosis.

Physical handicaps are varied but are commonly categorized as neurological or orthopedic in origin. The former results from injuries, congenital defects, or the progressive deterioration of portions of the central nervous system (CNS). Because most human functions are heavily dependent on an intact CNS, neurological disorders may present particular difficulty for the child and the educator. For instance, it is often difficult to determine a child's true intellectual ability because a motoric handicap may prevent the child from exhibiting it. Cerebral palsy, spina bifida, convulsive disorders, and poliomyelitis are common neurological disorders.

Orthopedic, or musculoskeletal, disorders may be congenital or adventitious. They affect the bones (including joints) and muscles. Accidents, diseases, and hereditary anomalies cause most of the orthopedic disorders. Some of the more common of these conditions are muscular dystrophy, amputations, osteogenesis imperfecta, scoliosis, arthritis, and Legg-Perthes disease.

Other children have conditions in which physical health is poor either permanently or intermittently. Although their conditions are frequently less visually apparent than neurological or orthopedic disorders, they may well face handicapping circumstances in many functional areas (e.g., academic performance, social acceptance). Among the most common of these conditions are epilepsy, cystic fibrosis, juvenile diabetes mellitus, sickle cell anemia, and hemophilia.

The physical anomalies that exist among the mentally retarded population are extensive. Over 250 have been classified so far. Even so, these represent no more than about 25 percent of the diagnosed cases of mental retardation in the United States. The American Association on Mental Deficiency (now American Association on Mental Retardation; Grossman, 1973) classified the known causal agents of mental retardation as follows: (1) infections and

intoxication; (2) trauma and physical agents; (3) metabolism and nutrition; (4) gross brain disease; (5) prenatal influence; (6) chromosomal abnormality; (7) gestational disorders; (8) psychiatric disorders. As with other physical anomalies individuals with mental retardation suffer from a wide array of affective and motor problems. However, it is their difficulty in cognition and adaptive behavior that best characterizes these children.

Physical anomaly is a term also used to describe a variety of physical aberrations that accompany a host of medical syndromes that typically require special education. Many of these syndromes are genetic disorders that are diagnosed by the specific constellation of physical anomalies apparent to the trained eye. In cases where only one or two minor physical anomalies are present (e.g., hair whorls and a palmar crease), they are often considered to be "soft signs" indicative of neurological problems. Observable minor physical anomalies are often related to neurological problems through coincidental development. The same initial tissue that develops during the embryonic stage into the central nervous system (the neural tube) also forms the epidermis, the outer covering of the body. Also, human chromosomes control more than one aspect of physical development and where one abnormality occurs, others are likely to be present.

Minor physical anomalies occur in many forms and in conjunction with a host of disorders. In Down syndrome (trisomy 21) one finds a broad flat face, pronounced epicanthal folds, a small palate, and malformed ears. Trisomy 13 will result in microcephaly, physical cardiac defects, polydactyly, cleft lip and palate, and malformation of the eyes and ears. Both of these syndromes frequently result in mental retardation ranging from mild to profound. Marfan's syndrome, most often associated with learning disabilities, though occasionally resulting in mild retardation, occurs with elongated arms and legs, arachnodactyly (long, spider-like fingers), and malformations of the eyes and heart.

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DOWN SYNDROME GENETIC FACTORS AND BEHAVIOR MENTAL RETARDATION MINOR PHYSICAL ANOMALIES

PHYSICAL EDUCATION FOR STUDENTS WITH DISABILITIES

Physical education is a means of developing motor and sports skills and physical fitness with disabled populations. Physical education programs for individuals with disabilities have been ongoing throughout the United States in residential, private, and public educational institutions (American Association of Health, Physical Education and Recreation, 1981).

The federal government's concern for disabled veterans during and after World War II and its provisions to mainstream and rehabilitate them played a seminal role in the development of adapted physical education. Adapted physical education is the commonly accepted term to designate physical education instruction to persons with disabilities in a public or private school setting. Veterans Administration hospitals use corrective, occupational, and physical therapists to help the veterans get back into the mainstream of society and to lead productive lives. Also, innovations developed through federally supported research have found their way in adapted physical education programs across the country (Sherrill, 1985).

From 1950, owing to a variety of political and legal means used by advocacy groups, programs for other disabled populations began to grow as the rights of disabled persons with congenital disorders advanced across a broad front. Evidence from numerous research studies began to indicate the positive value of sports participation for all disabled populations. Programs such as wheelchair sports and the Special Olympics focused on promoting athletic participation among disabled populations. From 1952 to 1979 the American Association for Health, Physical Education and Recreation (AAHPER) published a series of monographs on curriculum training of staff and guidelines for adapted physical education for schools (Adams, 1981).

It was not until the late 1960s and early 1970s that the federal government began to play a vital role in spurring the growth of adapted physical education programs in the public schools. Large sums of money were allocated for staff training of adapted physical education teachers, and for research and demonstration projects (Adams, 1981). The focus of these federally supported projects was to place more adapted physical education teachers in the field and to use special demonstration centers as models for others looking to upgrade their programs.

During the mid-1970s the federal government enacted

the Rehabilitation Act of 1973 (PL 93-112) and the Education for All Handicapped Children Act of 1975 (PL 94-142). The most far-reaching part of PL 93-112 was section 504. It stated that "no qualified person . . . shall be excluded from participation or denied the benefits . . . under any program receiving federal assistance" (Sherrill, 1985). This nondiscriminatory clause indicated physical education was an important concern.

Until the enactment of PL 94-142, there were very few physical education programs in the public schools for children with disabilities. The new law, however, stated that education for children with disabilities shall include instruction in physical education. Also, the regulations called for equal opportunities to intramural and interscholastic sports competition. As a result, all children with disabilities were accorded rights to physical education instruction to the same extent as the nondisabled (Auxter & Pyer, 1985).

Since 1975 more and more persons with disabilities are being identified and placed in adapted physical education programs. About 12 percent of the school-age population is disabled and receiving appropriate instruction. According to IDEA, children with disabilities must be placed in the least restricted school environment with an individualized educational program prepared by the appropriate personnel. This law provided the impetus for the use of individualized education plans (IEP) in physical education and the opportunity for children with disabilities to participate with nondisabled children in actual physical activity.

Because of the need to collaborate with other professionals regarding each disabled student's activity needs and educational goals, adapted physical educators may serve as part of a multidisciplinary team with occupational and physical therapists and the special education teacher.

Many terms have been applied to programs of physical activity for individuals with disabilities. Each of these terms represents a specific approach to improving motor and physical performance. Terms such as corrective, developmental, modified, therapeutic, or special physical education are representative of aspects of adapted physical education.

Corrective physical education is a means of remediating structural and functional dysfunctions through physical exercise or motor activities. The dysfunctions, although impairing, are generally correctable. Developmental physical education focuses on improving delayed motor and physical development through exercise and motor skill activities. Modified physical education has activities that are adapted to learning levels regardless of individual differences. Therapeutic physical education denotes the use of physical education activities under the prescription of a medical doctor. Special physical education is a selected program of developmental activities designed to meet the limitations of those who cannot participate in unrestricted and regular physical education. This term has not gained nationwide acceptance owing to its controversial connotation.

Adapted physical education is a "diversified program of developmental activities, games, sports, and rhythms suited to the interests, capacities, and limitations of students with disabilities who may not safely and successfully engage in unrestricted participation in vigorous activities of the general physical education program" (AAHPER, 1952).

By definition, adapted physical education includes activities:

- Planned for persons with learning problems owed to motor, mental, or emotional impairment, disability, or dysfunction.
- Planned for the purpose of rehabilitation, remediation, prevention, or physical development.
- Modified so the impaired, disabled, or handicapped can participate.
- Designed for modifying movement capabilities.
- Planned to promote optimum motor development.
- Occurring in a school setting or within a clinic, hospital, residence facility, daycare center or other locale where the primary intent is to influence learning and movement potential through motor activity.

Adapted physical education differs from regular physical education in that it has a federally mandated base and a multidisciplinary approach to individual program planning, covers an age spectrum from early childhood to adulthood, has educational accountability through the IEP, and emphasizes cooperative service among the school, community, and home to enhance a disabled person's capabilities (Sherrill, 1985).

The aim of physical education for individuals with disabilities is to aid in achieving physical, social, and emotional growth commensurate with their potential. Objectives of adapted physical education programs vary from program to program depending on population characteristics, instructional expertise, facilities, and equipment. Some of the commonly accepted objectives of most programs are

- To help students correct physical conditions that can be improved.
- To help students protect themselves from any conditions that would be aggravated through physical activity.
- To provide students with opportunities to learn about and participate in a number of appropriate recreational leisure time sports and activities.
- To help students to become self-sufficient in the community.
- To help students to understand their physical and mental limitations.
- To help students to understand and appreciate a variety of sports that they can enjoy as spectators.

Prior to participation in a physical education program conducted by a public school, the student with disabilities must have a thorough physical examination. Abnormalities are identified by the physician and suggestions for management are made to school personnel. The physician's suggestions usually include follow-through procedures to ensure proper class placement and appropriate educational placement based on the extent of physical activity needs and limitations. The adapted physical education teacher must be aware of the physician's guidelines and interpret them into an appropriate physical activity program.

Often, identification of the student needing special help is made by teacher observation in the regular physical education class or in the student's regular classroom. Sometimes the student is not making adequate progress or is frustrated by his or her present involvement in games and sports. The student may not be classified as needing special help because he or she passed the medical examination by the physician. In this case, the physical education program is adapted to suit the capabilities of the student.

Students with disabilities are required to take a battery of motor, physical fitness, and perceptual-motor tests for the making of the yearly IEP (AAHPER, 1981). Short- and long-term goals for the academic year are developed from the test results along with the specific activities recommended for each goal.

After being identified as needing special help, a handicapped student, depending on the size of the school, may be assigned to different types of programming classes. The first is a segregated program in which all of the students are in need of adapted physical education. The student receives individual attention, is accepted, and is protected from unlimited competition. The disadvantage of a segregated program is that the class fosters isolation and nonacceptance from peers. In the second type, a student may be placed in an integrated class participating with able-bodied students in the least restricted environment in terms of physical activity. Studies indicate that inclusive practices in physical education do not necessarily lead to peer acceptance for students with physical disabilities (Toon & Gench, 1990; Tripp, French & Sherrill, 1995).

A third type of physical education program for the student with disabilities is the dual class, in which the student is placed one day in the segregated class and one day in the integrated class. With this approach, individual attention may be given for special needs. At the same time, the student is able to interact with peers in the regular physical education class. Again, there is no guarantee that inclusion will work; therefore consistent evaluations must be made and kept ongoing.

Once a pupil with disabilities is given an appropriate physical education class placement, it is the role of the physical education instructor to provide a program of physical activity throughout the school year. In addition to planning

and implementing the IEP, the physical education instructor acts as a counselor to aid the student in:

- Setting reasonable physical activity goals
- Transferring class skills and habits to other environments
- Promoting healthful practices
- Coordinating program goals with the student's family and related services within the school and community
- Providing a framework that fosters socialization skills in the least restrictive environment
- Recording progress and continually evaluating needs and interests through physical activity

The aim of a physical education curriculum for individuals with disabilities is to develop physical fitness and motor skills through exercise and sports. For effective learning to take place, it is necessary to know the different levels of functioning in motor learning that affect a student's performance in class. There are three levels of functioning in motor skill acquisition: (1) input functions, (2) abilities, and (3) motor skill.

Basic input functions include the equilibrium reflexes, the vestibular system, vision, audition, and tactile and the kinesthetic senses. Their role is to provide sensory information to the central nervous system. If all systems are intact, the person will have a coordinated sense of movement and motion. If one or more are not intact, as is the case in many handicaps, it is important for the instructor to adapt activities that either develop or compensate for that input function.

The second level of functioning includes abilities that are perceptual-motor and physical in nature. Perceptual-motor abilities include balance, laterality, directionality, body image, spatial awareness and cross-lateral integration. Physical fitness parameters consist of strength, muscle and cardiovascular endurance, and flexibility. Motor fitness includes speed, power, agility, and motor coordination. If the sensory input functions are intact, the abilities develop through developmental motor and fitness experiences. If all of the abilities are intact, their use and development provide the groundwork for learning motor and sports skills.

The highest level of functioning is motor and sport skill acquisition. Motor skills are fundamental movement patterns of daily activity such as walking, running, hopping, etc. Sports skills are motor in nature but are specific to learning a particular sport. Examples of sports skills are throwing a ball, doing the crawl stroke, and riding a bike. If the input systems and the abilities are intact, then skill acquisition occurs through movement and sports experiences. This means instruction, practice, and instructional feedback in sport and movement activities.

Activities to develop motor, sports, and physical fitness are classified according to the number of participants and

the level of skill acquisition. Individual activities include swimming, self-defense, tennis, bowling, dancing, weight training, and karate. Team sports include such activities as wheelchair basketball, soccer, frisbee, and softball. The third type are activities that enhance physical and motor development such as aerobics, dance, and weight training. In many schools, classes may be subdivided according to skill levels within the particular activity. In swimming, for instance, there may be classes or subdivisions within a class for beginners, intermediates, and advanced swimmers.

For the student with disabilities to meaningfully participate in a sport, it is often necessary to modify some aspect of the sport to suit the capabilities of the student. For instance, wheelchair basketball is an adaptation of regular basketball in which the participants wheel around and pass the ball as opposed to dribbling and running. General guidelines followed by most instructors who teach adapted physical education state that the activity must be adaptable for effective learning to occur. This means that equipment, rules, or the manner of play may need to be modified for the participants. For instance, to accommodate the limited motor capabilities of a developmentally delayed group, the soccer field could be smaller and the ball could be lighter for it to be kicked farther and more accurately. In addition, activities could be designed to suit the students' abilities and not their disabilities. For example, a student with spina bifida is capable of learning how to swim because of intact upper body coordination. Finally, the instructor should be able to sequence and time learning experiences according to the students' capabilities.

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ADAPTIVE BEHAVIOR

OLYMPICS, SPECIAL

RECREATION FOR INDIVIDUALS WITH DISABILITIES

PHYSICAL DISABILITIES

A variety of interchangeable terms have been used to describe persons with physical handicaps. For example, these individuals will often be categorized as physically disabled, physically impaired, crippled, orthopedically impaired, other health impaired, or multiply handicapped. The legal definition for orthopedically impaired is a severe orthopedic impairment that adversely affects a child's education performance (IDEA). The term includes impairments caused by a congenital anomaly (e.g., clubfoot, absence of some member, etc.), impairments caused by disease (e.g., poliomyelitis, bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures or burns that cause contractures). The legal definition for other health impaired is having a condition that is manifested by severe communication and other developmental and educational problems; or having limited strength, vitality, or alertness because of chronic or acute health problems (e.g., a heart condition, tuberculosis, rheumatic fever, nephritis, asthma, sickle cell anemia, hemophilia, epilepsy, lead poisoning, leukemia, or diabetes) that adversely affect a child's educational performance (IDEA).

The range of disability varies from mild to profound physical impairment. Nonetheless, it is current practice to categorize students with physical handicaps as having average to above average intelligence, and physically handicapped/multiply handicapped students as having additional impairments such as mental retardation, blindness, or deafness. Additionally, mild to moderate learning disabilities often are found with students whose only handicapping condition is physical.

It is estimated that the incidence of physical disabilities is 2 percent (Smith, 1984). In the school year 1984–1985, 73,292 multihandicapped, 58,924 orthopedically impaired, and 69,688 other health-impaired students received special education services (Office of Special Education and Rehabilitation, 1985). The most common physical impairments found in schools are cerebral palsy, myelomeningocele (spina bifida), and muscular dystrophy. Although children with communicable diseases such as cytomegalovirus, herpes, hepatitis, and acquired immune deficiency syndrome (AIDS) are being denied entry into some schools (Dykes, 1984–1985), the incidence of these diseases is on the rise and will have to be addressed within the public school system.

Most physically disabled and health-impaired students are served in a combination of regular and special programs (Walker & Jacobs, 1984). Nevertheless, Dykes

(1984–1985) suggests that 85 percent of health-impaired and 35 percent of orthopedically impaired children should be served solely in regular classrooms. Physically and multiply handicapped students are usually served in special education classrooms, separate facilities, or hospital/homebound programs if their conditions do not permit inclusive programming.

The educational needs of physically disabled students vary as widely as the definitions, etiologies, and educational placements. For most physically handicapped students, the regular academic curriculum is most appropriate. In addition, an emphasis is placed on helping the students to gain independent living skills such as grooming, dressing, and food preparation. Perhaps the greatest needs of these students are in the areas of adaptive equipment (Campbell, 1983) and technology (Vanderheiden & Walstead, 1982). Often physically disabled students require wheelchairs, crutches, head pointers, arm and leg braces, etc. It is common for the physically disabled child to use a nonverbal/augmentative communication system (e.g., Zygo 100, Tetra-Scan II, Omni) or use computers for a variety of instructional purposes (Rushakoff & Lombardino, 1983). Technological advances have narrowed the gap in providing adequate educational instruction to students who cannot speak, move, or use their hands.

Another major area for intervention with physically disabled students is in social and self-concept development. Often the physically impaired student is characterized as passive, less persistent, having a shorter attention span, engaging in less exploration, and displaying less motivation (Jennings et al., 1985) and less self-esteem (Lawrence, 1991). Additionally, physically disabled students are found to be more dependent on adults and to interact less with their peers. Programs serving these students must consider socialization and independence. Parents as well as teachers need to find ways to facilitate independence and build self-esteem.

The education of physically disabled students requires a transdisciplinary team effort. Because the students have a variety of medical needs, educational program planning often will include pediatricians, neurologists, physical therapists, occupational therapists, speech clinicians, nurses, orthopedic surgeons, vision specialists, and most important, the families of these students. Often, families of physically disabled children must be the central focus of the educational process. It is with their support that programs in daily living and social skills training can actually work. Likewise, it is team support that enables families to more easily adjust to the demands of raising a child with physical or other health impairments.

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ACCESSIBILITY OF BUILDINGS MULTIPLE HANDICAPPING CONDITIONS OTHER HEALTH IMPAIRED

PHYSICAL RESTRAINT

A punishment procedure that involves the immobilization of limbs or the entire body is referred to as physical restraint. The intent of physical restraint is to decrease or eliminate the unacceptable behavior immediately preceding the onset of the physical restraint procedure. Physical restraint should be employed only after ample documentation is obtained that lesser intrusive interventions were ineffective.

Immobilization methods vary and may range from holding a student's hands by the side of the body to applying a mechanical arm restraint at the elbows to prevent self-injurious blows to the face. Several recommendations have been offered for implementing physical restraint procedures. Bitgood, Peters, Jones, and Hathorn (1982) recommend that the teacher be positioned behind the student and firmly grasp the student's shoulders to hold them against the back

of the seat. A second method of physical restraint involves holding the shoulders while the student is in a bent-over position in a chair (Reid, Tombaugh, & Heuvel, 1981). A third method is holding both of the student's hands behind the back of a chair (Rapoff, Altman, & Christopherson, 1980). The exact method of restraint will vary along several lines, including the size of the student; the size of the teacher; the alternative activity to be taught to the student to replace previously observed unacceptable behaviors; and the position of the student relative to the activity being taught.

In addition to actively immobilizing parts of a student's body, mechanical restraints can be employed. These restraints can restrict the student's movements to strike parts of the body, or materials (e.g., elbow pads, helmets, face masks) can be worn over injured areas to prevent future injuries.

The duration of time during which each instance of physical restraint is employed has varied from 3 seconds to 15 minutes, with most reported studies containing recommendations of 10 seconds to 1 minute. That is, following the occurrence of an unacceptable behavior, the teacher would employ a restraint procedure for a pre-established time interval. If the student is calm, nonaggressive and willing to verbally process the incident (Rich, 1997) at the end of the time interval, the restraint is removed. However, if the student continues to struggle as the time expires, an additional duration of time must elapse during which the student is calm prior to removing the physical restraint.

Applying physical restraint as a behavioral intervention should not automatically be associated with punishment. Researchers have observed that physical restraint may act as a reinforcer for continued maladaptive behaviors. Favell, McGimsey, and Jones (1978) evaluated situations in which physical restraint actually resulted in increased frequencies of aggressive behaviors. Similarly, Singh, Winton, and Ball (1984) documented an increase in out-of-seat behavior when followed by contingent physical restraint. Finally, Foxx and Dufrense (1984) evaluated the reinforcing effects of hinged metal splints on the self-injurious behavior of a mentally retarded resident within a large residential facility. Interestingly, the authors were able to fade a self-restraint of a preferred object (large plastic glass) to a socially accepted form of self-restraint in the form of a wristwatch and eye-glasses.

Reasons cited for the reinforcing properties of physical restraint include a relaxing feeling of being immobile and resultant drowsiness; physical contact from a reinforcing adult i.e. attachment (Bath, 1994); reduction in demands placed on the student who escapes from disliked activities by engaging in unacceptable behaviors resulting in physical restraint procedures.

When physical restraint results in a decrease or elimination of unacceptable behavior, several potential advantages may occur: undue physical strength or endurance by the

teacher may not be required; little staff training is required; no verbal instruction is necessary, although some teachers include a verbalization of the unacceptable behavior prior to the physical restraint; minimum level of discomfort is afforded the student; the student cannot engage in unacceptable behaviors while being restrained; long-lasting effects are observed; and few side effects are noted.

Potential disadvantages that need to be considered prior to the implementation of a physical restraint procedure include an inability of small-frame teachers to restrain physically stronger students; the association of restraint with close physical contact and attention from the teacher; time lost from educational activities while the student is restrained; restraint itself may be reinforcing for the student; procedures have the potential to be highly aversive and intrusive; the student's physical strength may be increased through isometric type of exercising while resisting the restraint; an inexperienced teacher may use physical restraint in an arbitrary, capricious manner; physical restraint has the potential for injury.

Guidelines have been offered for the judicious application of physical restraint procedures, and teachers need to safeguard the rights of each student by adhering to at least the following:

1. Obtain informed consent from the student's guardian
2. Closely monitor the procedure to prevent intentional or unintentional abuse
3. Positively reinforce appropriate behaviors
4. Consider less restrictive alternatives prior to physical restraint
5. Use minimum physical force
6. Document length of time and frequency of instances of physical restraint
7. Administer physical restraint only in a contingent manner
8. Train all individuals in all environments frequented by the student
9. Maintain a resource file of successful documentations of the use of physical restraint to guide the development of the parameters for a targeted student
10. Fade the intensity of restraint materials to socially acceptable, nondebilitating materials (Foxx & Dufrense, 1984)
11. Identify functional, life skill activities to replace self-injurious or stereotypic behaviors when decreasing unacceptable behaviors via physical restraint

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PHYSICAL THERAPY

Physical therapists are responsible for physical restoration. Employing a variety of equipment, they use massage and regulated exercise to improve coordination and balance, reeducate muscles, restore joint motion, and increase the patient's tolerance for activity.

A physical therapist employs mechanical and muscle strengthening exercises to assist students who will benefit from these activities to improve their quality of life. Physi-

cal therapists are frequently members of interdisciplinary teams, where they contribute to the overall management of the patient. The goal of most client service is to obtain entry into independent living and competitive employment. An example of services might include deep heat, paraffin baths, hydrotherapy, mild stretching, or strengthening exercises for a person with a crippling arthritis; strengthening and coordinating exercises for a person with a cerebral palsy; development, frequently in concert with an occupational therapist, of exercises for mobility through walking, leg braces, a wheelchair, or some combination; and the appropriate use of any prosthetic devices. Braces, wheelchairs, and other appliances require instruction in their use and care. Physical therapists generally teach these skills. They also join with occupational, speech, hearing, or other therapists in assisting the patient in the use of the prosthetic device to accomplish independent living or vocational skills.

Physical therapy, then, is the act of teaching motor strengthening, motor control, balance, and other skills to persons with disabilities. It combines these motoric trainings with prosthetic devices to help the patient to accomplish needed goals by reducing the effects of disability. Physical therapy is one aspect of the total training needed to reduce the effects of disability to enable the person with a disability to profit from residual (normal) bodily functions. Frequently, both the general public and the person with a disability, particularly the newly disabled person, become overwhelmed at the presence of a handicapping condition. What frequently is not seen is the amount of usable function that remains. The principle involved is to provide the person with a disability with training of muscle groups, motor control, balance, etc., to promote the use of the residual, nondisabled functions.

A few of the categories and types of skills taught in physical therapy as they apply to special education are listed.

1. Health (severity of problem health behaviors)
2. Attendance and promptness (degree of presence in school and time-telling behaviors)
3. Feeding/eating (degree of competency in eating skills)
4. Drinking (degree of competency in drinking skills)
5. Toileting (degree of competency in toilet skills)
6. Grooming (degree of competency in washing, showering, and personal hygiene skills)
7. Dressing (degree of competency in independent dressing skills)
8. Undressing (degree of competency in independent undressing skills)
9. Nasal hygiene (degree of competency in maintaining hygienic and socially acceptable conditions of the nose)

10. Oral hygiene (degree of competency in toothbrushing behavior)
11. Self-identification (degree of competency in pointing to body parts, knowing family members, and information about self)
12. Sensory perception (degree of competency in discriminating among stimuli on the basis of touch, taste, smell)
13. Auditory perception (degree of competency in discriminating among stimuli on the basis of auditory cues)
14. Visual Motor I (degree of competency in interpreting simple fine-visual motor skills)
15. Visual Motor II (degree of competency in integrating complex visual motor skills)
16. Gross Motor I (degree of competency in demonstrating simple mobility, eye-hand coordination, and gross motor skills)
17. Gross Motor II (degree of competency in demonstrating complex gross motor skills, motor sports)
18. Prearticulation (degree of competency in controlling mouth parts)
19. Articulation (degree of competency in making vowel and consonant sounds)
20. Language comprehension (degree of competency in understanding communication)
21. Language development (degree of competency in using gestures, sounds, and words to communicate)
22. Listening (degree of competency in attending and reacting to verbal communication)
23. Adaptive behaviors (degree of competency involving exploratory play and problem-solving skills)
24. Impulse control (degree of competency in controlling disruptive behaviors and accepting criticism)
25. Interpersonal relations (degree of competency in cooperating and interacting with others in social situations)
26. Responsible behaviors (degree of competency in accepting rules, obeying authorities, and demonstrating socially approved behaviors)
27. Personal welfare (degree of competency in demonstrating safe behaviors in hazardous conditions)

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OCCUPATIONAL THERAPY PHYSICAL DISABILITY

PHYSICIAN'S DESK REFERENCE

The *Physicians' Desk Reference*, known popularly as the *PDR*, is an annual publication of Medical Economics Company. It reports information on more than 2500 drugs. The information is supplied entirely by the drug's manufacturer but is edited and approved by medical personnel employed by the publisher. The *PDR* contains descriptions of drugs (with pictures in many cases of the most common form), indications for use, recommendations regarding dosage levels, and antidotes for some drugs. Management information for overdosage developed by the Institute for Clinical Toxicology is also presented. The *PDR* is intended primarily for use by physicians and was developed to make readily available essential information on major pharmaceutical products. The *PDR* is useful to allied health professionals and to special educational personnel. It is particularly useful to the latter because of the high incidence of medication usage by children with disabilities. The *PDR* is likely to be available in the reference library of any special education program.

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PHYSIOTHERAPY

Physiotherapy or physiatry is the treatment of disease with the aid of physical agents such as light, heat, cold, water, and electricity, or with mechanical apparatus. The person responsible for physiotherapy is a physiatrist: a physician who specializes in physiotherapeutics or physiotherapy. Physical therapy, or the application of physiotherapy as practiced by physical therapists or occupational therapists, is supervised by the physiatrist responsible for the physical therapy unit.

The primary purpose of physiotherapy is to provide for the controlled movement of the extremities and for the other muscle and joint articulation necessary for the activities of daily living or competitive employment. Muscles are strengthened, coordination exercises are offered, and mechanical (nonchemical) applications to increase the range of motion and strength for each joint are provided.

The range of patients includes those suffering from damage to either the central or peripheral nervous systems; those suffering from any disease or mechanical injury; and those afflicted with a birth defect affecting muscle and bone. Two primary systems treated are the skeletal and nervous systems. Some of the more common conditions treated are strokes (cerebral vascular accidents), cerebral palsy, head trauma, spinal cord injuries, arthritis, polio, and a number of inherited and acquired bone, joint, or muscle problems.

Educators have traditionally used the term physically handicapped to categorize those children and youths who,

because of bodily disability, require specialized education. Under such a rubric, physical handicap equates with bodily disability; therefore, practically all handicapping conditions are physical (e.g., vision and hearing impairments, forms of mental retardation, and brain injury).

Generally, a physical handicap can contain four characteristics: (1) a neuromuscular disability resulting from damage to the central nervous system; (2) a disability related to a lower common neural pathway (nerves and muscles outside of the central nervous system); (3) a disability resulting from an injury or disease that destroys nerves, muscles, or bone peripheral to the central nervous system; or (4) a health impairment that reduces vitality and thereby results in a weakened physical condition.

Diagnostically the two major groups are orthopedically handicapped and other health impaired. The orthopedically handicapped constitute the group that is neuromuscularly handicapped as a result of insult or trauma to the central nervous system or as a result of lower common neural-muscular-orthopedic (skeleton system) damage peripheral to the central nervous system. Other health-impaired conditions have numerous etiologies but have in common a condition that so weakens the individual that he or she must limit or modify the activities and therefore participate in physiotherapy to obtain relief.

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ORTHOPEDIC IMPAIRMENTS OTHER HEALTH IMPAIRED

PIAGETIAN APPROACH TO SPECIAL EDUCATION

Jean Piaget (1950, 1952, 1977), Switzerland's noted genetic epistemologist, proposed a developmental and constructivist model of human cognition from birth to adolescence based on biological processes. Although his theory has been applied to regular education for several decades, fewer efforts have been made to apply his work to exceptional populations (Gallagher & Reid, 1981; Reid, 1981; Wachs & Furth, 1980). One reason for this apparent lack of interest is Piaget's derivation of theoretical principles from observations of essentially normal children, with the consequent assumption of lack of applicability to handicapped individuals. A second obstacle has been an assumed lack of fit between more holistic and social/linguistic (Beilin, 1996) instructional goals and strategies compatible with Piagetian theory and the specific, step-by-step goals and methods typically prescribed for handicapped learners. Nevertheless, Piaget's cognitive-

development theory provides a useful means of understanding and teaching children with exceptional needs.

Concepts integral to Piaget's theory include structures, adaptation, stages of development, conservation, equilibration, and egocentrism. According to his theory, cognitive development consists of progression through an invariant sequence of stages, with the child incorporating the structures (organized patterns for dealing with the environment) acquired at each stage into qualitatively different, higher order structures at each succeeding stage. The child's progression from stage to stage results from adaptation, which describes the process of interaction between the child's current maturational level and environmental stimuli. Two complementary processes constitute adaptation: assimilation and accommodation. Assimilation refers to the child's incorporation of features of the environment into his or her existing structures. Accommodation is the modifying of one's structures in response to environmental demands. To illustrate, when an infant desires to touch a new mobile dangling from the crib, the infant must accommodate his or her vision and movements to the distance. Simultaneously, the infant assimilates the mobile into already existing patterns of behavior: structures for reaching and grasping.

As a result of adaptation, the developing child continually creates new structures out of previously acquired structures to better interact with the environment. Piaget describes the development of these structures in terms of a series of stages: sensorimotor, preoperational, concrete operational, and formal operational. The sensorimotor stage (birth to 1½ years) describes the infant and prelinguistic child. The infant manifests cognition through actions on objects, such as jiggling the crib to set a mobile in motion. The preoperational stage (1½ to 7 years) is characterized by use of language, symbolic behavior, and lack of conversational logic. The 2-year-old child demonstrates symbolic behavior by pretending that a broom is a horse and "riding" it. The preoperational child has not yet acquired the structures necessary for conservation: the ability to recognize that matter is conserved despite superficial changes in shape or form. For example, when a 3 year old is presented with two identical balls of clay, one of which is subsequently rolled into a cigar shape, the child perceives the remaining ball and the cigar as being unequal in size. When asked which is larger (or "has more"), the child may attend only to length and select the cigar, or only to width, and choose the ball. The child does not consider the two dimensions simultaneously.

Children in the stage of concrete operations (7 to 12 years) have acquired the rules of conservation as well as an understanding of relational concepts. The fourth state, formal operations (12 and above) describes children who can use abstract rules in problem solving and conceptualize in hypothetical terms.

Piaget's theory postulates that although children vary in the age at which they reach a given stage, all follow the

same sequence. Progression from stage to stage occurs through equilibration, or the reorganization of structures through assimilation and accommodation, resulting in higher order structures. Disequilibrium, or a state of conflict, occurs when the child's current structures are applied (assimilation) and found insufficient to the task. According to Piaget, the child is inherently motivated toward equilibrium and therefore toward resolving the conflict. For example, the child entering the stage of concrete operations recognizes that the cigar-shaped clay is longer than the ball and yet was an equivalent ball in its original form. To resolve the conflict, the child reorganizes (accommodates) his or her structures; new structures for the simultaneous consideration of the two dimensions of length and width and for conservation result. The child thus reaches a new state of equilibrium.

Piaget's constructivist model has been used to explain social cognition, or children's logical understanding of themselves and other individuals in interaction. Children's development of social cognition parallels their intellectual development, progressing through a sequence of stages from egocentric to sociocentric thought. The infant is egocentric, or centered around the self. As children mature and gain experience with the environment, they become decentered; they learn that the self is separate from other people, that other people have thoughts and feelings, and that other people's thoughts and feelings may differ from their own. Development of social cognition in several areas parallels stages of cognitive development. These areas include referential communication, role taking, moral judgment, and rule implementation.

Referential communication refers to one's ability to describe a stimulus such that the listener can correctly locate the same stimulus out of an array of similar items, and is examined using speaker-listener pairs or dyads. Young children's referential communication is often termed egocentric in that they usually fail to consider the listener's perspective. For example, a 2 year old requesting a favorite cup may ask a listener to bring the "cup Grandpa gave me," not recognizing that the listener is not privy to Grandpa's gift. Role or perspective taking refers to the ability to consider other people's point of view: their thoughts, feelings, or, literally, what is in their range of vision. Children progress from a lack of separation between self and environment (early infancy) to simultaneous consideration of multiple perspectives.

Three stages characterize children's development of moral judgment: objective morality, subjective morality, and interpretation of the act (Piaget, 1932). Children in the stage of objective morality base their judgments of good and bad behavior on objective criteria such as the amount of damage incurred, for example, when someone breaks a lamp while trying to clean the table. In subjective morality, good or bad intentions become a prime criterion for judging behavior. At the highest level, children simultaneously

consider intent and outcome and develop a sense of moral responsibility for the own actions.

Children's play and use of rules in play follow a similar developmental pattern. In parallel play, young children share materials and physical proximity but act independently, without a common set of rules. At a later stage (incipient cooperation), they know the rules and attempt to win at games. Finally, children together develop and elaborate rules appropriate for the situation (genuine cooperation).

Much of the research on Piaget's theory has addressed the invariance of the sequence of stages: the impact of specific training on development, especially on acquisition of conservation; the relationship of social cognition to cognitive development; and the relationship between social cognition and social behavior. For a more comprehensive discussion of the research, the reader is referred to Flavell (1971, 1972) on invariant sequence, Klein and Safford (1977) on training, and Shantz (1975) on social cognition.

In general, the research in all four areas has produced somewhat inconsistent results interpretable in a variety of ways depending on the researcher's theoretical orientation. Moreover, attempts to measure level of cognitive development have been criticized as producing merely another assessment of general intelligence. Studies of cognitive development in young children have questioned preschoolers' apparent egocentricity and inability to conserve as artifacts of task difficulty (Gelman, 1979). On the other hand, inconsistent findings regarding stage invariance, training of conservation concepts, and correlation between stages of cognitive and social cognitive development may be interpreted within a Piagetian framework as reflective of the fact that a given child may simultaneously be at different stages of development for different concepts (e.g., conservation of quantity, conservation of mass, role taking, moral judgment). Inconsistencies may result from investigators' use of different measures to assess levels of cognitive development. In addition, procedures may fail to discriminate between children who have already attained a given stage and children who are in transition between stages.

Because cognitive development results from an interaction between child structures and environmental stimuli, differences in quantity and quality of experience may affect acquisition of concepts. For example, a mentally disabled child with a chronological age of 10 and a mental age of 7 might be expected to perform at approximately the same level as an intellectually average child with a chronological and mental age of 7 and a gifted child with a chronological age of 5 and a mental age of 7. However, differences among these children in years of experience would impact on acquisition of cognitive concepts. In short, although more definitive research is needed, Piaget's theory of cognitive development has contributed significantly to thinking about the learning process.

Piaget himself made little reference to the application of his theory to educational practice. However, psycholo-

gists and educators have derived from Piaget's work several principles for instruction appropriate for both academic and social learning. Piaget's theory, applied to special populations, assumes that all children, disabled and nondisabled, proceed through the same invariant sequence of stages using the same processes of assimilation, accommodation, and equilibration. Thus, while the rate of development may differ for exceptional learners, the instructional principles continue to be applicable. Experimental attempts to propel children (exceptional and nonexceptional) to a higher level of development through training generally have been unsuccessful (Gallagher & Reid, 1981), theoretically because children's stage progression depends on maturation as well as environment. The instructional principles that follow are directed at the teaching of concepts, generalizations, and thinking processes rather than at increasing the level of cognitive development.

1. Because children's thinking is qualitatively different at the various stages of development, teaching objectives should be matched to children's level of development.
2. Learning is the acquisition of higher order structures transformed from and built on previous structures. Thus, learning involves the acquisition of broad, general rules or frameworks rather than particular, isolated facts. As such, learning proceeds through understanding rather than through incorporation of rote responses.
3. Children are internally motivated by a desire for achieving equilibrium. Thus, learning is facilitated by the presentation of optimally challenging tasks and discrepant events that predispose the child to disequilibrium.
4. Children learn best through interacting with and manipulating environmental stimuli.
5. Group interactions may present children with ideas that challenge their own, leading to disequilibrium, reorganization, and new structures.

These principles have been translated into more specific guidelines for teaching learning-disabled students (Moses, 1981). These guidelines are appropriate for other special needs children:

1. Begin with an encountering stage that permits children to interact with the materials before a problem is posed. Present concrete materials that permit children to experience and impose many kinds of change.
2. Allow children to set goals before they deal with transformations.
3. Present problems that involve puzzling transformations. Create situations that stimulate children to infer and reason spontaneously.

4. Permit children's creation and use of alternative methods of problem solving.
5. Accept children's methods of problem solving, even if they lead to failure.
6. Create a nonthreatening, nonexternally evaluating atmosphere. Avoid praise, criticism, or other announcements that label children's responses, since external evaluation reinforces dependence on the environment.
7. Require children to anticipate or predict the results of their actions, observe outcomes, and compare their hypothesized outcomes with results.
8. Be responsive to the children: listen, accept all responses, and respond with appropriate feedback.

Teaching methods consistent with these principles and guidelines include cooperative learning, hypothesis testing, discovery learning, inquiry, and other approaches that encourage inductive thinking. Cooperative learning is an instructional strategy whereby students work together in small groups to complete academic tasks. Potential benefits include gains in academic content, basic skill development, problem solving, and socialization. More research is needed on the efficacy of cooperative learning with exceptional students (Pullis & Smith, 1981). Gallagher and Reid (1981) describe hypothesis testing approaches for teaching exceptional students as another method consonant with Piagetian theory.

The inductive approaches developed by Taba and her colleagues (Taba et al., 1971), and Suchman's problem-solving methods (Kitano & Kirby, 1986), provide step-by-step information for developing teaching activities consistent with Piagetian theory and applicable to mildly handicapped and gifted students. Taba's inductive approaches include methods for developing concepts, attaining concepts, applying generalizations, exploring feelings, and solving interpersonal problems. For example, a concept attainment strategy for the concept "square" requires teacher presentation of examples and nonexamples of squares and children's induction of a definition for square. Teachers may use the developing concepts strategy for assessing children's current ideas about a subject and for encouraging classification of concepts related to the subject. Suchman's problem-solving approach provides a concrete method for children's attainment of such objectives as letter, numeral, color, and shape names, vocabulary, sight words, and arithmetic facts.

A federally funded research project (Kitano et al., 1982) provides preliminary data supporting the use of inductive methods based on Suchman's problem-solving approach with mildly mentally retarded and learning-disabled elementary-age students. Results indicated that learning-disabled children who received instruction in language arts using inductive methods showed gains similar to those achieved by learning-disabled controls who received instruc-

tion with traditional didactic and behavioral approaches. As a group, the educable mentally handicapped children demonstrated greater achievement in language arts objectives with inductive approaches than matched peers in the control condition. These results suggest that inductive methods may constitute a viable addition to traditional approaches to instruction with mildly handicapped learners. While more research is needed to validate the efficacy of such approaches for special populations, the approaches have theoretical merit and provide alternatives to traditional deductive methods.

Piaget's theory of cognitive development has had specific application to mild and severe/profound mental retardation, learning disabilities, gifted, and other categories.

Mental Retardation

Although Piaget's writings reflect little interest in individual differences, his ideas have been used to interpret the cognitive behavior of exceptional individuals. For example, Inhelder (1968) noted that the level of cognitive development ultimately achieved by mentally retarded individuals depended on their degree of impairment, with the severe-profound fixated at the sensorimotor level, the moderately retarded at the preoperational stage, and the mildly retarded rarely advancing beyond the level of concrete operations.

During the 1960s and 1970s, Piaget's theory sparked a new view on the field of mental retardation. The developmental approach to mild, familial mental retardation provided a positive alternative to deficit approaches, which assume that mentally handicapped individuals by definition possess deficits (e.g., in processes such as attention, memory, organization, or in neurological structures) that require remediation. The developmental view, articulated by Zigler (1967; Zigler & Balla, 1982) and Iano (1971), suggests instead that the familial educable mentally retarded constitute the lower end of the normal curve and differ from the intellectually average only in terms of rate of development and final level achieved. Mental age serves as an indicator of current developmental level.

In general, proponents of developmental theory as applied to the mildly mentally retarded suggest that this approach enables teachers to view retarded children in terms of normal stages achieved at a slower rate. Klein and Safford (1977) concluded from their review of research literature that stages of development in the mentally retarded population parallel those described by Piaget for nonhandicapped children, but appear at later chronological periods. Hence, the mildly retarded can be expected to perform according to their mental ages. The implication for educators is that methods applied to normal children can be used effectively with mildly retarded students of similar mental age. Thus, these individuals can profit from many regular instructional techniques and a broader curriculum appropriate to normally achieving children. Iano (1971) noted that edu-

cators too often assume that the mentally retarded have deficiencies in learning rate, retention, and the ability to generalize and abstract. As a result, teachers emphasize great amounts of repetition, structure, concrete presentation, and slow, step-by-step introduction of new material. He asks whether the retarded child's failure to reason and problem solve is due to an inability to understand or to an emphasis in teaching on the rote and mechanical.

Although the developmental approach as applied to mental retardation has received serious criticism (e.g., Spitz, 1983), research has neither disproved the developmental approach nor proved the deficit position, and probably never will (Spitz, 1983). In the meantime, the application of Piagetian instructional methods with the mildly retarded merits serious investigation and offers an exciting alternative to teachers wishing to broaden their instructional repertoire. Most important, application of Piagetian approaches to instruction may provide variety and challenge to the children themselves.

Piaget's descriptions of the sensorimotor stage, normally covering birth to 18 months, have served as a basis for interpreting the behavior of the severely/profoundly handicapped, assessing their level of cognitive development, and developing appropriate curricula. The six substages of the sensorimotor period can be summarized as follows (Stephens, 1977), together with sample instructional tasks appropriate to each.

Reflexive (Birth–1 Month)

This phase is initially characterized by reflex actions (e.g., hand waving, kicking, crying, sucking, grasping) and visual tracking of objects. These actions become more coordinated and generalized. Sample task: To encourage visual tracking, hold a bright moving object 10 inches from the subject's eyes and move the object slowly across the subject's field of vision. If visual tracking fails to occur spontaneously, physically turn the subject's head to follow the object.

Primary Circular Reactions (1–4.5 Months)

Reflexive behavior becomes elaborated and coordinated. The infant becomes interested in movement itself, as in observing his or her own hand waving. Repeated as ends in themselves, these actions are "circular" responses. Sample task: Move a colorful, sound-producing object from side to side and up and down to encourage coordination of visual tracking and touching of the object with the hand. If visual tracking coordinated with touching the object does not occur spontaneously, physically guide the behavior.

Secondary Circular Reactions (4.5–9 Months)

The infant intentionally repeats chance movements that produce a desirable effect (e.g., shaking a rattle to produce

a sound). Sample task: Demonstrate a squeeze toy and hand it to the subject. Guide the squeezing behavior to elicit the sound if the behavior does not occur spontaneously.

Coordination of Secondary Schema (9–12 Months)

The infant begins to discriminate between self and environment, to imitate speech sounds and movements of others, and to differentiate means and ends. Sample task: Demonstrate and guide a means-ends activity such as dropping an object into water to create a splash.

Tertiary Circular Reactions (12–18 Months)

The infant actively experiments and discovers new means to ends, such as pulling a blanket to reach a toy that is resting on it. Sample task: Provide opportunities for (and guidance as necessary) discovering a means-ends activity such as obtaining an unreachable object using a stick.

Invention of New Means Through Mental Combinations (18–24 Months)

The infant considers alternatives, solves problems, and completes development of object permanence. Sample task: Demonstrate and permit experimentation with fitting objects of different sizes and shapes into slots of various size and shape.

Based on her earlier work with severely retarded individuals, Woodward (1963) concluded that many of the seemingly inappropriate behaviors of this population are explainable within a Piagetian framework. Given that profoundly handicapped individuals operate at a sensorimotor level, mannerisms such as hand flapping in front of the eyes can be interpreted as sensorimotor patterns developed in the course of coordinating vision and grasping, as in the subphase of primary circular reactions.

Uzgiris and Hunt (1975) developed an assessment procedure for charting infant development founded on major areas of cognitive functioning during the sensorimotor period. Such an assessment procedure can be adapted for use with severely/profoundly handicapped individuals of various chronological ages. Areas of functioning assessed by Uzgiris and Hunt include visual pursuit and object permanence; means for achieving desired environmental events; gestural and vocal imitation; operational causality; object relations in space; and development of schemas in relation to objects.

Because severely/profoundly handicapped individuals generally do not proceed beyond the preoperational stage, curricula can be derived for this population based on the sensorimotor subphases and adapted according to chronological age. Development of appropriate curricula of a Piagetian nature for the severely/profoundly handicapped requires matching objectives to the individual's present

level of development; active involvement of the individual; opportunity for the individual to proceed at his or her own pace; opportunities for exploration and manipulation; opportunities for repetition and practice; and adaptation for any associated sensory or motor impairments.

Learning Disabilities

By most definitions, learning-disabled students possess average to superior intellectual potential but manifest academic and social achievement at levels significantly lower than this potential would predict. Delays in cognitive and social-cognitive development have been explored through research as possible factors in explaining the discrepancy between potential and achievement in academic and social areas. Suggestions for teaching interventions based on Piagetian theory have also been offered in the literature.

Research

In general, the research suggests that learning-disabled (LD) children demonstrate performance inferior to that of nondisabled (NLD) children on tasks designed to measure cognitive development and social cognition. Speece, McKinney, and Appelbaum (1986) found a developmental delay in LD children's attainment of concrete operations compared with nondisabled (NLD) controls over a 3-year period. However, their results also suggested that when the LD children attained the concrete operational stage, they acquired specific concepts in the same sequence and at the same rate as did NLD children. Moreover, for the LD but not the NLD group, Piagetian measures of cognitive development (conservation scores) and age better predicted academic achievement than did verbal intelligence. Most important was the finding that while the LD children as a group improved over the 3-year period, they failed to catch up with their NLD peers. Speece et al. (1986) concluded that delayed cognitive development may constitute an important explanatory factor for continued academic underachievement experienced by LD children despite intervention.

Dickstein and Warren (1980) reported similar delays in LD children's role-taking ability compared with NLD children in cognitive, affective, and perceptual tasks. Their analysis of the performance of children from 5 to 10 years of age suggested that larger differences in scores occurred in the younger age groups and that performance among LD children improved little between ages 8 and 10. Horowitz (1981) also found lower performance for LD children on an interpersonal role-taking task, but no significant differences between the two groups on a perceptual role-taking measure. However, as indicated by Horowitz, results were confounded by differences between the two groups in intelligence. Wong and Wong (1980) found significant differences between LD and NLD children in role taking, with LD girls demonstrating much poorer skills than LD boys.

Finally, investigations of LD children's referential communication skills corroborate the findings on role taking that LD children possess deficits in social cognition relative to their NLD peers. Noel (1980) found LD students less effective in providing descriptive information about objects than NLD controls because of the LD children's tendency to describe objects by shape rather than by label or name. Spekman (1981) further reported that LD speakers tended to give more unproductive, irrelevant, or repetitious messages than did NLD children on communication tasks. These findings suggest that LD children communicate less effectively than do NLD children.

As a whole, results of investigations on role taking and communication suggest that deficits in these skills may be one source of social problems evidenced by some LD children. Having difficulty in anticipating other people's views and accommodating their messages to others' needs reduces LD children's chances for successful social interactions.

Teaching

The literature has suggested Piagetian-derived instructional strategies for LD students both as tools for presenting academic content and for remediating deficits in social-cognitive skills. Gallagher and Quandt (1981) presented questioning strategies consistent with Piagetian theory for improving reading comprehension of LD students. They suggest, for example, the use of inference questions that require students go beyond the information given. Such questioning strategies present puzzling problems that stimulate equilibration. Moses (1981) offers examples of arithmetic instruction to illustrate the use of Piagetian guidelines for teaching LD students. Role-taking training through each child's sequential adoption of the various roles in a story also has been suggested (Chandler, 1971) as a vehicle for improving role-taking skills and social behavior.

Gifted

As with other areas of exceptionality, Piaget's theory as applied to the gifted has implications for research and practice.

Research

Piaget's theory would predict that the intellectually gifted, like the intellectually handicapped, follow the same sequence of stages as average children but differ in rate of progression. Carter and Ormrod (1982) found through their review of research that mentally retarded, average, and gifted children follow the same sequence of stages, supporting Piaget's view of sequence invariance. However, studies investigating differences between gifted and nongifted learners in rate of progression have yielded conflicting results. Carter and Ormrod suggest that discrepant findings

might be due in part to differences in age groups studied. For example, young gifted children may not show superiority over average children in rate of cognitive development because such development, according to Piaget, is limited by maturity and experience, which may not differ significantly in quantity or quality in the early years.

There is some evidence to suggest that gifted children progress more rapidly than average children within a stage but achieve transitions to concrete and formal operations at approximately the same age as their peers. However, research by Carter (1985) and Carter and Ormrod (1982) indicates that gifted children both progress more rapidly than average children within a stage and demonstrate earlier transition to succeeding stages. In a study of 125 gifted and 98 average children aged 10 through 15, Carter and Ormrod (1982) found that the gifted outperformed controls at each age level and achieved formal operations at earlier ages. Specifically, the gifted students appeared to enter formal operations by age 12 or 13, while the average students, including 15 year olds, had not yet attained formal operations. Carter (1985) compared the cognitive development of 180 intellectually gifted, 325 bright average, and 168 average children ages 10 to 16. Major findings were that the gifted children outperformed intellectually average children at all age levels and outperformed bright average children at the lower age levels (10 to 14). Data were interpreted as indicating that gifted children establish their cognitive advantage as early as age 10. These studies suggest that intellectually gifted children may achieve higher stages of cognitive development at earlier ages than their average peers.

Despite common observations that gifted children express earlier concerns about morals and values, research on gifted children's social-cognitive development does not provide clear evidence that gifted children are advanced in this area relative to their average peers. Moral reasoning has some relationship to verbal intelligence. However, while some intellectually gifted students demonstrate advanced levels of moral judgment development, this is not true of all gifted students.

Teaching

Gifted children who are advanced in cognitive development compared with their intellectually average peers may require special interventions to prevent boredom and accompanying frustration. However, educators should not assume that all gifted children function at an advanced stage of cognitive development relative to their chronological age. Rather, every child should be assessed to determine level of cognitive development.

The process of concept acquisition through equilibration described by Piaget has relevance to instruction for the gifted. Guidelines for instruction consistent with Piaget's theory, described earlier, appear highly appropriate for gifted students because of their consistency with goals for

the gifted, including optimum use of intellectual abilities, development of self-direction, and practice in higher level thinking skills (e.g., analysis, synthesis, evaluation). Kitano and Kirby (1986) describe specific methods for teaching the gifted consistent with Piagetian guidelines.

Other Categories

A few investigators have examined the application of Piagetian principles to children with other types of exceptionalities: cerebral palsy, hearing handicaps, visual impairments, and emotional disturbance. A review of these studies by Gallagher and Reid (1981) suggests that (1) intellectually normal children who have cerebral palsy progress at approximately the same rate as nonhandicapped children, although the former are slower to perform on tasks requiring manipulation, need more trials and encouragement, and have a lower frustration tolerance; (2) deaf children and blind children display minor or no delays in attainment of conservation compared with normal peers when accommodations are made for language and sensory differences and subjects are carefully matched; and (3) seriously emotionally disturbed children show deviations from normal developmental patterns.

In conclusion, the available research on cognitive development of exceptional learners suggests, for the most part, that exceptional individuals progress through the same sequence of stages described by Piaget for normal children, although they vary in rate of development and level ultimately attained. Application of Piagetian theory to practice suggests use of strategies that engage children in active problem solving appropriate to their current level of development. Additional research is required to demonstrate the efficacy of Piagetian-derived instructional strategies for handicapped and gifted learners. Such strategies have potential as additions to the instructional repertoire of special education teachers.

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COGNITIVE DEVELOPMENT
DIRECT INSTRUCTION
INDIVIDUALIZATION OF INSTRUCTION
INTELLIGENCE
PIAGET, JEAN

PIAGET, JEAN (1896–1980)

Jean Piaget was a Swiss psychologist whose explorations of the cognitive development of children helped to revolutionize education in the twentieth century. He described the sequence of mental development in three phases: (1) the sensory-motor phase, from birth to about age 2, during which children obtain a basic knowledge of objects; (2) the phase of concrete operations, from about 2 to 11, characterized by concrete thinking and the development of simple concepts; and (3) the formal operations phase, from about age 11, emphasizing abstract thinking, reasoning, and logical thought. Piaget's theories and descriptions of developmental sequences have encouraged teaching methods that emphasize the child's discovery of knowledge through the

presentation of developmentally appropriate problems to be solved.

Born in Neuchâtel, Switzerland, Piaget was educated at the university there, was director of the Jean Jacques Rousseau Institute in Geneva, and professor at the University of Geneva. In 1955 he established in Geneva the International Center of Genetic Epistemology, where he and his associates published voluminously on child development.

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PIC

See PERSONALITY INVENTORY FOR CHILDREN.

PICA

The word "pica" originates from the Latin word for magpie, a bird known for ingesting a wide variety of food and non-food items (Danford & Huber, 1982). Pica is seen in various species, including birds, fish, apes, and humans (Diamond & Stermer, 1998). Pica as a disorder is characterized by habitual ingestion of inedible substances (Kerwin & Berkowitz, 1996). It is frequently associated with mental retardation (Danford & Huber, 1982), but also occurs in normal young children (less than age 3) and pregnant women within certain cultural groups. As many as 90 percent of children with elevated levels of blood-lead may show pica behavior. Pica sometimes continues into adolescence and adulthood (Diamond & Stermer, 1998). In infancy and early childhood, children often chew on their cribs, wood, sand, and grass as a method of early exploration (Erickson, 1998).

According to *DSM-IV*, pica is defined as "persistent eating of nonnutritive substances for a period of at least 1 month" that is "inappropriate to the developmental level" or "not part of a culturally sanctioned practice." *DSM-IV* also states that if pica behavior occurs in conjunction with another mental disorder (e.g., mental retardation, pervasive developmental disorder, or schizophrenia), it should be sufficiently severe to warrant independent clinical attention for a separate diagnosis to be given (APA, 1994, p. 96). Pica may be both underdiagnosed and undertreated (Katsiyannis, Torrey, & Bond, 1998).

Paint chips, dirt and sand, paper, fabric, feces, cigarette stubs, and bugs are among the substances commonly consumed by those with pica. Pica is a prevalent cause of lead poisoning, especially in children, due to lead-based paint that is common in cribs, other wooden objects, and some dirt. Dirt near houses may particularly contain lead in paint that has flaked off outside walls. Pica can also lead to severe nutritional deficits, intestinal obstruction or perforation, parasitic infections such as toxoplasmosis (through eating of cat feces), and even death (Katsiyannis et al., 1998; Kerwin & Berkowitz, 1996; Wiley, Henretig, & Selbst, 1992). Intestinal blockage may necessitate surgery to remove the obstruction.

Although pica is generally associated with adverse consequences, eating dirt or clay under some conditions may have benefits. The practice of eating soil is termed “geophagy.” Geophagy may relieve hunger, provide grit for grinding food, provide nutritional value, cure diarrhea, buffer stomach contents, or protect against toxins (Diamond & Stermer, 1998). In the southeastern United States, pregnant women may eat clay and/or laundry starch owing to a superstitious belief that the practice prevents fetal curses and reduces the side effects of pregnancy (Nelson-Wicks & Israel, 1997). In one area of China, where geophagy is common, some people consume soil in a belief that it provides valuable nutrients. Indeed, a soil sample from the area contained iron, calcium, and manganese. In Zimbabwe, where people eat soil to soothe upset stomachs, one sample contained kaolin, an ingredient that pharmaceutical companies use to treat diarrhea (Current Science, 1998). South American Indians reportedly regularly eat toxic potatoes mixed with an alkaloid-containing clay. The clay neutralizes the potatoes’ toxicity (Diamond & Stermer, 1998).

Pica is a learned behavior, but its maintenance may owe to a number of factors. Since one of those factors may relate to a nutritional inadequacy, medical and nutritional analyses should precede any treatment program (Katsiyannis et al., 1998). If it is associated with some nutritional inadequacy, pica may be successfully treated with some dietary changes or mineral supplements targeted at the particular deficiency. In cases where no nutritional problem is found, a functional analysis of behavior should be conducted. Several types of behavioral interventions have been used successfully, ranging from less intrusive (e.g., differential reinforcement for non-pica behavior) to more aversive (e.g., overcorrection or brief physical restraint contingent upon pica). Obviously, any treatment program should begin with the least restrictive interventions unless the child’s behavior presents an immediate risk. One interesting treatment uses a “pica box.” A pica box is a small box containing edible items for a child. When a child attempts to eat a nonedible item, he or she is stopped, and after a brief time-out, is reinforced by being allowed to get a treat out of the pica box. This method has been especially useful in working with mildly retarded and autistic children (Hirsch & Myles, 1996). A particular

source for those in special education is Katsiyannis et al. (1998), who not only describe several programs in detail but provide useful case studies.

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ANOREXIA NERVOSA EATING DISORDERS LEAD POISONING OBESITY

PICTORIAL TEST OF INTELLIGENCE— SECOND EDITION

The Pictorial Test of Intelligence—Second Edition (PTI-2; French, 2001) is an individually administered measure of intelligence designed for use with children with and without disabilities. Its multiple choice format and lack of time constraints make it useful for children with motor or speech delays or both. No vocalization is required on the part of examinees; they need only point to the correct response. Motorically impaired children can respond by fixing their eyes on the correct response, since the stimulus cards and the space between the choices are large enough to allow this accommodation.

PTI-2 is composed of three subtests. Verbal Abstractions measures the child’s ability to demonstrate word knowledge, verbal comprehension, and verbal reasoning using pictorial

stimuli. Form Discrimination measures the child's ability to match forms, differentiate between similar shapes, and reason about abstract shapes and patterns. Quantitative Concepts measures the child's ability to perceive and recognize size and number symbols, count, and solve simple arithmetic problems.

Scores on these three subtests ($M = 10$, $SD = 3$), are combined to yield a composite score ($M = 100$, $SD = 15$) referred to as a Pictorial Intelligence Quotient (PIQ). The choice of the abbreviation PIQ may lead to some confusion with Wechsler's PIQ (Performance IQ).

Directions for subtests are provided both on the examiner's side of the easel and in the record book. Basal and ceiling rules, as well as starting and stopping points, are simple to understand. The manual provides raw score to standard score and percentile conversions. Age equivalents are also supplied, but the author discourages users from reporting them.

The PTI-2 was standardized on 970 children from 15 states who were selected to correspond to the 1997 census report. Stratification variables included age, gender, race, ethnicity, residence (urban and rural), disability status, family income, and parental education. The average number of children tested at each age level was 162, with the smallest numbers at ages 3 ($N = 136$) and 8 ($N = 144$). While the school age norms approximate the U.S. population, the demographic characteristics of the preschool sample are not described.

Split-half, test-retest, and interscorer reliability statistics presented in the manual reflect excellent internal consistency and stability as well as agreement between raters. Internal consistency was addressed through split-half procedures for the entire normative sample. Coefficient alphas for PIQ exceed .90 at every age, with an average reliability of .94. The reliabilities for the three subtests exceed .80 at every age. Stability data is limited to a study of 27 Wyoming children between the ages of 5 and 8. Evidence for criterion-related validity is limited to one study examining the correlation between the PTI-2 PIQ, the Cognitive Abilities Scale—Second Edition (CAS-2; Bradley-Johnson & Johnson, 2001) and the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-R; Wechsler, 1989) in a small group ($N = 32$) of 8-year-olds.

The PTI-2 is an objective and quickly administered measure of general cognitive ability. The manual is clear, thorough, and well organized. Overall, the psychometric properties of the PTI-2 are very good, though the standardization sample could be better defined. Additional validation studies with other, larger, and more representative samples are needed.

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PICTURE EXCHANGE COMMUNICATION SYSTEM

The importance of communication and social competence among school-age children is undisputed. Children with communication disorders may have difficulty communicating verbally, resulting in frustration and inappropriate externalizing behaviors. The Picture Exchange Communication System (PECS) teaches children to communicate through an exchange of pictures and symbols, thus avoiding the need to verbalize (Bondy & Frost, 1994). This direct behavioral intervention is divided into a series of phases that become increasingly more complex, eventually leading to independent communication through the use of picture cards.

Research on PECS is limited. However, some evidence suggests its use increases verbal speech, social-communicative behavior, spontaneous language, and appropriate social interactions, and decreases problem behaviors (Charlop-Christy, LeCarpenter, LeBlanc, & Kelley, 2002). Preschoolers with severe communication delays and disorders can effectively and quickly learn to use PECS and are able to generalize these skills across numerous settings (Schwartz, Garfinkle, & Bauer, 1998).

Actions directed to the environment that lead to reward-like outcomes may not constitute communication. Communication must involve actions directed toward other individuals (Frost & Bondy, 2002). For example, a child may cry and point to a toy that is difficult to reach, resulting in an adult getting the toy for the child. Another child may approach an adult and ask for the toy. Although both examples have the same result, the first is not an example of communication. This rationale provides the theory behind the use of PECS.

Parents and teachers of nonverbal children initiate communication through questions (e.g., What do you want? Are you hungry? Do you want the ball?) However, PECS emphasizes initiation of communication by the child rather than through questions from an adult. Children are taught strategies to appropriately and independently

obtain the attention of an adult; only then will the adult acknowledge the child and accept the picture card exchange.

PECS recognizes the importance of communication and attempts to promote it. Typically, developing children learn to persist when trying to initiate communication by using repetition, raising their voice, or tapping on another's shoulder continually until the person responds. They understand the importance of persistence in communication. PECS attempts to promote persistent communication patterns in children with communication disorders who otherwise may not exhibit such persistence as a result of many unsuccessful attempts that cause the child to quit or revert to inappropriate behaviors.

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ASPERGER SYNDROME AUTISM

PIERRE-ROBIN SYNDROME

Hypoplasia of the mandible, prior to 9 weeks of intrauterine development, results in a posteriorly located tongue which, in turn, impairs closure of the posterior or soft palate. Children born with the syndrome of micrognathia (small lower jaw) are at risk for airway obstruction which may be present at birth or develop over the first month of life, requiring endotracheal tube or tracheostomy. Lack of oxygen can lead to damage to the heart and brain during this critical period. Most infants are otherwise normal and mandibular growth catches up, the long-term prognosis is good both for appearance and function. This anomaly is, however, also seen as part of other multiple malformation syndromes that may include mental retardation.

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PIERS-HARRIS CHILDREN'S SELF-CONCEPT SCALE—SECOND EDITION

The Piers-Harris Children's Self-Concept Scale—Second Edition (PHCSCS-2; Piers, Harris, & Herzberg, 2003) is an individually or group administered paper and pencil, self-rating scale that assesses an individual's perception regarding self-esteem, self-concept, and personal regard. The PHCSCS-2 may be used as a screening instrument for children and adolescents age 7 through 18 to determine the need for additional assessment, treatment, and to aid in the determination of emotional difficulties in youth when accompanied by other psychological measures. It is often used in collaboration with other psychological batteries of assessment in both clinical and school settings as a means of gaining first-hand evidence of a youngster's views about him- or herself as well as to further support other personality and projective measures. The scale is frequently included in research endeavors and can also be used as a means to monitor an individual's level of self-concept over time.

The scale consists of 60 items reflecting descriptive statements that require the individual to select a "yes" or "no" response based on his or her personal perceptions about how the statement reflects his or her character. A second grade reading level is required for individuals completing the scale. The scale consists of the following domains:

Total Score (TOT): A measure of global self-concept and level of self-esteem based on 60 items.

Behavioral Adjustment (BEH): Consists of 14 items and reveals acceptance or denial of problematic behaviors within the home and school environment.

Intellectual and School Status (INT): Includes 16 items reflecting the individual's views regarding one's own intellectual and academic abilities.

Physical Appearance and Attributes (PHY): Consists of 11 items that measures the individual's assessment of his or her physical appearance, leadership skills, level of assertiveness, and ability to express oneself effectively.

Freedom From Anxiety (FRE): Consists of 14 items that elicit information pertaining to level of anxiety and

dysphoric/depressed mood. This particular domain taps into the individual's perception of one's emotional experiences, such as sadness, fears, nervousness, and related areas.

Popularity (POP): Consists of 12 items that address the individual's level of socialization skills, participation in age-related activities, and one's ability to make friends.

Happiness and Satisfaction (HAP): Consists of 10 items reflecting the individual's level of personal satisfaction with life.

The instrument also includes two validity scales to identify inconsistencies in responses from the individual and specific tendencies toward responding in a consistent manner (i.e., responses geared in a direction to appear positive or negative). This aspect of the scale allows the examiner to determine if the individual completing the scale attempted to exaggerate or distort responses to gain an outcome, obtain attention, or appear in a socially desired manner.

The scoring system for the PHCSCS-2 consists of normalized *t*-scores and percentile scores. Qualitative descriptors accompany scores for specific ranges. Raw scores are converted into *t*-scores that have a mean of 50 and a standardized deviation of 10. Percentile scores represent the percentage of individuals from the normative sample whose scores were less than the individual being evaluated. The interpretive labels consist of Very Low, Low, Low Average, Average, High Average, High, Very High for the Total Score, and Very Low, Low, Low Average, Average and Above Average for the domain scales.

The PHCSCS-2 was standardized on a nationally represented normative sample that included 1,387 students from the United States between the ages of 7 through 18 years old. Individuals were recruited from elementary, middle, junior, and high school. The sample was based on a demographically diverse standardization sample including consideration of aspects such as age, sex, ethnicity, socioeconomic status, and representation from various geographic regions of the United States.

The internal consistency coefficients for each domain ranges from .74 through .91, indicating good internal consistency throughout the cluster scales. Test-retest reliability data were not yet available for the PHCSCS-2 as the instrument was recently revised; however, based on the original PHCSCS, which consisted of 80 items, coefficients were cited as .77 for both 2- and 4-month intervals between testing, indicating the potential for stability across testing. (Note that the 60 items contained on the revised PHCSCS-2 remained fairly consistent to the original 80 items on the PHCSCS.) Reviews of the PHCSCS-2 are pending for the upcoming *Sixteenth Mental Measurements*.

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PINEL, PHILIPPE (1745–1826)

Phillipe Pinel, French physician and pioneer in the humane treatment of the mentally ill, served as chief physician at two famous mental hospitals in France, the Bicêtre and the Salpêtrière. Convinced that mental illness was not a result of demoniacal possession, as was commonly believed, but of brain dysfunction, Pinel released his patients from the chains that were used to restrain them and replaced deleterious remedies such as bleeding and purging with psychological treatment by physicians.

Through publications in which he set forth his methods for the care and treatment of the mentally ill, Pinel's ideas gained wide acceptance throughout the western world. France, through Pinel's efforts, became the first country to attempt the provision of adequate care for the mentally ill.

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PITUITARY GLAND

The pituitary is a small gland located at the base of the brain immediately beneath the hypothalamus, above the roof of the mouth, and behind the optic chiasma. The pituitary lies

in a bony depression called the sella turcica. The pituitary is also sometimes referred to as the hypothysis.

The pituitary regulates the secretions of a number of other endocrine glands and often is referred to as the master gland. However, its function is closely linked to the hypothalamus, and the pituitary and hypothalamus must be thought of as a system rather than independent entities. The hypothalamus and the pituitary are connected by a rich supply of nerves called the infundibulum.

Morphologically, the pituitary is a small gland. It weighs less than a gram and is only about a centimeter in diameter. It consists of two major lobes, the anterior pituitary (adenohypophysis) and the posterior pituitary (neurohypophysis). These two lobes are connected by a much smaller pars intermedia. The anterior pituitary manufactures a number of hormones that serve to trigger the release of still others. The hormones directly secreted by the anterior pituitary include growth hormone, thyroid-stimulating hormone (TSH), adrenocorticotrophic hormone (ACTH), and gonadotrophic hormones such as follicle-stimulating hormone (FSH), luteinizing hormone (LH), and lactogenic hormone (prolactin).

Adrenocorticotrophic hormone (ACTH) is intimately involved in stress reactions. Release of this hormone by the pituitary causes the adrenal cortex to produce cortisol and other steroid hormones that help prepare the body for fight or flight. Gonadotrophic hormones (e.g., follicle-stimulating hormone and luteinizing hormone) activate the ovaries and testes so that estrogen and testosterone, respectively, are produced.

Prolactin is a hormone that affects the mammary glands and that appears to be involved in the regulation of maternal behavior in vertebrates. Somatotropin (STH or growth hormone) is a hormone necessary for normal growth. Excesses of somatotropin result in the clinical condition of acromegaly.

It is useful to view the pituitary as a link in a complex chain of events that tie the hypothalamus to other glands. However, the hypothalamus lacks direct neural connection with the anterior pituitary, and instead influence is exerted by release factors transported through a complex system of blood vessels called the hypothalamic-hypophyseal portal system.

The posterior pituitary (neurohypophysis) secretes antidiuretic hormone (ADH) and oxytocin. Release of these hormones is triggered by complex connections with other parts of the nervous system. The cells of the posterior pituitary do not produce hormones themselves but instead serve as storage sites for hormones produced by the anterior hypothalamus. When blood pressure falls, the secretion of ADH stimulates the kidneys to reduce their excretion of water into the urine. Lack of ADH can produce diabetes insipidus. Oxytocin plays an important role in inducing contractions during labor, and it is necessary for the contraction of the

smooth muscles of the mammary glands, which are needed to produce milk in response to sucking.

It has been found that individuals with anorexia and bulimia have some pituitary atrophy due to nutritional and/or endocrine alterations (Doraiswamy, Krishnan, Figiel, & Husain, 1990).

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ANOREXIA NERVOSA BULIMIA NERVOSA DIABETES EATING DISORDERS

PKU

See PHENYLKETONURIA.

PLACEBOS

Placebos are substances or therapeutic interventions that produce their effects as a result of the expectations of the recipient and the therapist. As originally applied in medicine, placebo therapies improved patients' conditions despite the fact that the placebos had no direct physiological action. Placebos, therefore, became an aid to physicians who lacked a specific therapy and a nuisance variable to researchers studying therapeutic effectiveness.

The placebo effect is most powerful in social situations where an experimental approach produces high hopes for success (Orne, 1969). To differentiate between placebo and direct therapeutic physiological effects, it has become commonplace in drug research to use a double-blind procedure. In such a design, both the person administering the therapy and the subject are unaware (blind) as to whether a given dose contains the experimental substance or a physiologically inert placebo. If the placebo and treatment interventions result in similar effects, the value of the new therapy

is called into question. Practical or ethical considerations often limit the applicability of double-blind studies, and the existence of potential placebo effects remains a problem in a variety of areas of research.

Although placebos may be physiologically inert, recent research has indicated that they may have a biological effect. For example, Levine, Gordon, and Fields (1978) have provided some evidence that placebos that were supposedly analgesics activated the endorphins that are the body's internal painkillers.

There has been great controversy concerning the use of the placebo concept in understanding behavioral change interventions. Simeon & Willins (1993) suggest that there has not been enough research done in the use of placebos with children. Critelli and Neumann (1984) have argued that the placebo effect is more than a nuisance variable and the display of empathy, nonpossessive warmth, etc., that may occur in a placebo intervention may be an important part of the therapy. In the classroom, the expectations of teachers and students about the probabilities of high student performance during an educational intervention may play a significant role in its effectiveness (Zanna, Sheras, Cooper, & Shaw, 1975).

Thus both the special education researcher and classroom teacher may need to take placebos into account. The researcher may wish to provide a placebo control group where subjects receive a treatment that is irrelevant to the planned intervention. Such a treatment allows control subjects to experience the attention that goes to those undergoing the treatment of interest (Cook & Campbell, 1979). The classroom teacher should be aware of the combination of placebo and direct effect of interventions and, therefore, foster expectations of success.

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DOUBLE-BLIND DESIGN TEACHER EXPECTANCIES

PLACENTA

The placenta (Latin for “cake”) transfers life-sustaining supplies from the mother to the prenat, disposes of the prenat's wastes, and protects the prenat from some harmful substances. It begins to form during the germinal period and becomes differentiated as a separate disk-shaped organ during the embryonic phase (Annis, 1978). The umbilical cord extends from the center of the smooth fetal surface. The maternal surface is composed of many convoluted branches, creating a surface area of about 13 m², which provides maximum exposure to blood vessels in the uterine lining. At term the placenta is about 18 cm in diameter and weighs about 570 g.

The placenta includes two completely separate sets of blood vessels—one fetal and one maternal. Only small, light molecules may pass through the placental barrier; maternal and fetal blood never mix. Although the exact mechanisms of transfer of nutrients and wastes between the two systems are not completely understood, transfer of gases and water is accomplished by simple diffusion (Hyttén & Leitch, 1964). The placenta protects the prenat from overexposure to elements in the mother's blood (e.g., hormones and cholesterol) by reducing their concentration in the fetal blood; it also prevents some teratogens from reaching the fetus.

In a small percentage of pregnancies, impairments involving the placenta create serious consequences. In about 10 percent of pregnancies the placenta fails to produce progesterone in the early weeks, resulting in spontaneous abortion. Infrequently, the placenta is small or malformed, causing retarded fetal growth or possibly stillbirth. When the placenta partially or entirely covers the cervical opening (placenta previa), the membranes usually rupture early in the third trimester, leading to a premature delivery.

Even during normal functioning, the placenta is an imperfect filter. As the fetus matures, placental blood vessels enlarge and stretch the placental barrier more thinly, thus decreasing its ability to filter larger molecules. Many harmful agents (e.g., bacteria) are kept out during the early prenatal stages, when teratogens are potentially most dangerous. For example, syphilis cannot cross until after the twentieth week. Viruses (including rubella), because they are so small, are able to pass through during this critical period. Many chemicals that the mother ingests that are potentially harmful (e.g., alcohol, caffeine, and carbon monoxide) pass through in ever-increasing dose levels as the placental barrier thins.

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CONGENITAL DISORDERS PREMATURITY

PLANTAR REFLEX

The word plantar means "of, pertaining to, or occurring on the sole of the foot" (Rothenberg & Chapman, 1994). The plantar reflex is observed when the sole of the foot is scratched or stroked with a dull object and the toes bunch or curl downwards. The plantar response is a reflex that involves all the muscles that shorten the leg and the toes and is present in normal children (after the age of one year), adolescents, and adults.

Abnormal response to the plantar stimulation is usually in the form of the big toe extending upward toward the head, the toes fanning out, and withdrawal of the leg. This response is known as the Babinski reflex or sign and is indicative of neurological damage.

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APGAR RATING SCALE BABINSKI REFLEX DEVELOPMENTAL MILESTONES

PLASTICITY

Plasticity in the human sciences is the absence in an individual of predetermined developmental characteristics

and a concomitant modifiability by organismic or environmental influences. The concept is not limited to the capacity to change in accord with outside pressure. It includes the power to learn from experience and modify behavior while retaining predisposing genetic inheritance (Kolb & Whishaw, 1998). Educator John Dewey (1916) emphasized the characteristic plasticity of the immature child as a specific adaptability for growth. Basic to this concept is a person's power to modify actions on the basis of the results of prior experiences. In addition, plasticity implies the development of definite dispositions or habits. Habits, Dewey wrote, give control over the environment and power to use it for human purposes.

As a feature of the young child, plasticity is often most evident in exceptional children where deviation from the norm is significant. It has been seen frequently in gifted children, in schizophrenic children, and in some children with organic brain disorders (Bender, 1952). Many such children show prodigious accomplishments or become late bloomers and manage to make up for what they might have missed in earlier years both in educational and social development.

A study by Chess, Korn, and Fernandez (1971) of 235 victims of a 1964 worldwide rubella epidemic began when the youngsters were 2 years old. Development showed an overall delay during the first years of life, with characteristic impairment in language and motor sensorimotor functions. One-third of the children were diagnosed as showing varying degrees of mental retardation during the preschool period, while only one-fourth showed evidence of mental retardation at ages eight and nine. The IQs of the nonretarded children also showed progressive increases as they entered the school-age period. Detailed case studies of a number of the children who showed such improvement demonstrated that they came through a diverse and roundabout pattern to normal school functioning. Often they pioneered new territory in the acquisition of language, social development, and learning—thereby affirming the inherent plasticity of human brain function in the young child.

Similar individual-specific roads to cognitive language and social functioning have been demonstrated for children with congenital heart disease who had corrective surgery, children who contracted polio before the days of the Salk vaccine, children with rheumatic fever, and children with chronic kidney disease. Studies of blind children have demonstrated similar plasticity (Fraiberg, 1977) and Attention-Deficit/Hyperactivity Disorder (Jensen et al., 1997).

Plasticity takes on a negative connotation as applied by Bender (1953) to the concept of childhood schizophrenia. According to Bender, a physiological crisis may interfere with the maturation of the child in every area of functioning. The disturbance has a plastic quality that gives a primitive pattern to all behavior and renders the child incapable of satisfactorily dealing with autonomic responses, motility perceptions, symbol formation, language, ideation, and in-

terpersonal relationships. This causes anxiety and elicits defense mechanisms. Because of the plastic quality of the disorder, any function or area of behavior can be retarded, regressed, fixated, or accelerated. In *Principles of Education*, Bolton (1910) stated, "Where there is evolution, there is plasticity" (p. 8). Biological plasticity underlies the adaptive physiological process primary to organic evolution. Psychological plasticity underlies the adaptive behavior process primary to education and social evolution.

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INTELLIGENCE

ZONE OF PROXIMAL DEVELOPMENT

PLATO AND THE GIFTED

Plato was among the earliest philosophers to formulate a classification of students within three levels of public education. Plato wanted to separate "men with hearts and intellects of gold" to train and educate them for the highest functions of the state as kings, rulers, or executives. Without proper nurture, the brightest student would not be likely to be willing to serve the state's citizens (Burt, 1975).

Plato's three levels of public education included common elementary school, secondary school with selective admission, and a state university with admission still more selective. On the elementary level, the curriculum covered literature, music, and civics. On the secondary level, students were prepared for future military and civil service posts by studying in the curriculum areas of mathematics, arithmetic, plane and solid geometry, astronomy, and harmonics. In higher education there were 5 years of "dialectic" learning

followed by 15 years of practical experience for those chosen to be the leaders of the ideal state (Brumbaugh, 1962).

These rulers or guardians were trained and later employed for external warfare and internal police work. The 15 years of rigorous intellectual training prepared the select few for lives as philosophers. Plato's ideal state depended on its kings being philosophers or its philosophers being kings (Plato, 1973/393BC).

The republic of Plato required education for both men and women. This was thought to be revolutionary at the time. Women received the same educational opportunities and training for the mind and body; they were also instructed in the art of war. If a woman possessed the right natural gifts, she shared the highest of public duties equally with men. Every occupation was open to her, but it understood that she was physically weaker. A man's nature was thought to be suited for majesty and valor and a woman's for orderliness and temperance (Morrow, 1960).

The idea of gifted students within the educational system was especially evident in the republic during the open discussions on mathematics. Plato believed that all students should be introduced to mathematics and discussed how this subject had an effect on the mental powers of a student; he believed it sharpened a student's wits and helped to fix attention. The skills of higher mathematics were seen as needed by the chosen few future rulers. These gifted students would study with systematic thoroughness and exactness (Morrow, 1960). Students were chosen for this advanced curriculum if they demonstrated that they understood the general connection of the various curriculum areas. If a student successfully grasped both a practical and theoretical connection, at the age of 30 the student would be admitted to the highest and most complete of all possible studies—philosophy.

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GIFTED CHILDREN

HISTORY OF SPECIAL EDUCATION

PLAY

Play among humans can be described as an attitude rather than a category of behaviors (Damon, 1983). Play is often regarded as the opposite of work in so far as attitude is concerned. A child who is having fun with an activity (as evidenced by laughing and smiling) is playing. Conversely, a child who is practicing his game skills to perfection is working. In fact, it has been suggested that the word play is most effectively used as an adverb, as in "the child stacked the blocks playfully" (Miller, 1968).

Regardless of its seemingly nonserious origins, play is a critical developmental activity. Many aspects of our social, motor, and cognitive lives have their origins in childhood play. The famous Russian psychologist Lev Vygotsky argued throughout his short, albeit brilliant career, that play creates the conditions for the child's acquisition of new competence in imaginative, social, and intellectual skills. Recently, computers and the internet have provided a new form of play for many children and adolescents (Griffiths & Hunt, 1995).

One method of classifying children's play is based on interactions with other children. Five categories of play can be distinguished (Parten, 1932). The first type, solitary play, involves no interaction at all with other children. In onlooker play, the second type, the child simply observes other children at play. This is thought to be the first phase of a preschooler's interaction with other children.

When children begin to engage in the same activity side by side without taking much notice of each other, parallel play is said to occur. Associative play, the fourth type, occurs in older preschoolers; in this type, play becomes much more interactive. During this phase, two or more children partake in the same activity doing basically the same thing; however, there is no attempt to organize the activity or take turns.

Cooperative play, an organized activity in which individual children cooperate to achieve some sort of group goal, usually does not appear until age 3. At this stage children become more able and eager to participate in social forms of play. Solitary play does not ever disappear. Most children are capable of playing alone if a companion is not available. Onlooker behavior persists even into adulthood.

The symbolic nature of play is vital to the development of the child; it performs several functions in that development. First, children can use their symbolic skills, like language, in new and different ways, in a sense testing the limits of those skills. Second, children can, through play, do and say things that are normally difficult to express or taboo. Third, as children exit infancy they can use play in a cooperative, social fashion. "Make believe" allows children to explore social roles, work in cooperation with others, and experiment with social roles and rules (Damon, 1983).

Children who are handicapped may be less able to use play effectively and therefore may lose out on some of the important outcomes of play. For example, a child with a

physical disability may not be able to engage in normal social play with other children. Hence, that child needs special arrangements or interventions to make sure that he or she has access to normal opportunities for play (Cattanach, 1995).

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CONCEPT OF ACTIVITY

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ZONE OF PROXIMAL DEVELOPMENT

PLAYTEST

The PLAYTEST procedure is recognized as one possible approach to screening and direct assessment of an infant's auditory functioning (Butterfield, 1982). The PLAYTEST system was originally developed by B. Z. Friedlander as a research tool for measuring infants' selective listening and receptive voice discrimination abilities within the home environment (Friedlander, 1968).

The system consists of a simple, portable, automated toy apparatus that attaches to the infant's crib or playpen. An audio or video-audio recorder and response recorder complete the equipment. The apparatus are attached at different locations on the crib or playpen. When the infant attends to either device, the responses activate the accompanying stereophonic tape recorder. The tape recorder is fitted with an endless loop audio tape. Certain systems are equipped to provide video-audio feedback instead of just audio feedback. Separate channels on the device carry different prerecorded sound samples.

The infant's frequency and duration of response to the various sources of auditory stimuli are used to infer the current level of auditory discrimination and selective listening abilities. Both the audio and the video-audio PLAYTEST systems use a response recorder to register the infant's differential response to the various auditory stimuli.

The PLAYTEST system has proven a valuable research tool in the investigation of auditory functioning in infants (Friedlander, 1968, 1970, 1971, 1975). One interesting finding is that very young infants show a clear preference for the mother's voice as opposed to a simple musical score.

It appears that the PLAYTEST system also provides an invaluable means of identifying infants at high risk for developing significant language disorders later in life (Butterfield, 1982; Friedlander, 1975). Butterfield (1982) envisions the PLAYTEST procedure as an instrumental screening and assessment procedure in the very early detection of auditory processing and/or discrimination problems in infants. He has described modifications of the existing system that would enable professionals to assess infants less than 6 months of age for possible auditory dysfunctions (Butterfield, 1982).

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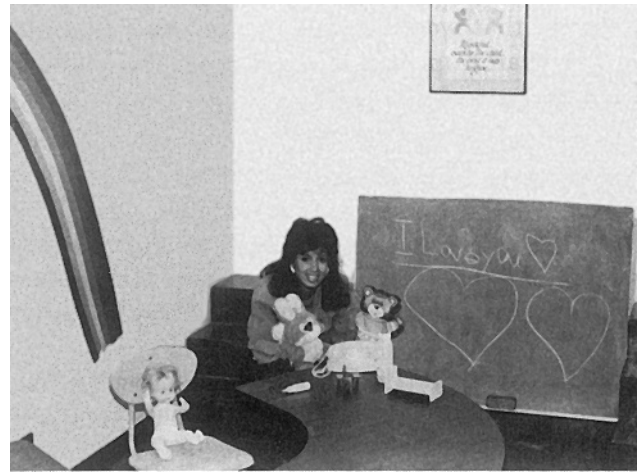
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AUDITORY DISCRIMINATION DEAF LANGUAGE DISORDERS

PLAY THERAPY

Play therapy is a therapeutic technique used with children that emphasizes the medium of play as a substitute for the traditional verbal interchange between therapists and adult clients. The roots of play therapy can be traced back to the psychoanalytic work of Sigmund Freud (1909), and



Small furniture, a pleasant atmosphere, and a caring therapist, all prerequisite to successful play therapy

the classic case of Little Hans, in which Freud directed the child's father in techniques used to treat the child's severe phobia. Direct work with a child was first initiated by Hug-Hellmuth (Gumaer, 1984), who applied Freudian analysis to children under age 7. It soon became apparent that children lacked the verbal ability, interest, and patience to talk with a therapist for an extended period of time. Thus in the late 1920s, both Melanie Klein and Anna Freud developed therapeutic methods that used play as the child's primary mode of expression (see Figure). Anna Freud stressed the importance of play in building the therapeutic relationship, deemphasizing the need for interpretation. Klein, however, approached play therapy much like traditional adult psychoanalytic work, with free play becoming a direct substitution for free associations, and insights and interpretation retaining primary importance.

In the following decade, Otto Rank was an important contributor with his notion of relationship therapy. Rank stressed the importance of the emotional attachment between the child and the therapist, focusing mainly on present feelings and actions of the child. In the 1940s and 1950s, Carl Rogers' client-centered therapy was modified by Virginia Axline (1947) into a nondirective play therapy. Axline's work, which has remained one of the cornerstones of current play therapy, is predicated on the belief that the child has within himself or herself the ability to solve emotional conflicts. According to Axline, it is the job of the play therapist to provide the optimal conditions under which the child's natural growth and development will occur. The basic rules of Axline's approach have become the standard for nondirective play therapy. They include the development of a warm relationship, acceptance, permissiveness with a minimum of limits, reflection of feelings, and giving the child responsibility for directing the sessions, making choices, and implementing change.

The effectiveness of play therapy has been attributed

to its direct relevance to the child's developmental level and abilities. Woltmann (1964) stresses that play allows the child to act out situations that are disturbing, conflicting, and confusing and, in so doing, to clarify his or her own position in relation to the world around. Inherent to the success of play therapy is the make-believe element. Through fantasy and play, children are able to master tasks (drive a car, fly a spaceship), reverse roles (become parent or teacher), or express overt hostility without being punished. Woltmann believes that play therapy allows the child to "eliminate guilt and become victorious over forces otherwise above his reach and capabilities." Caplan and Caplan (1974) provide a further rationale for the effectiveness of play therapy. They contend that the voluntary nature of play makes it intrinsically interesting to the child and reduces the occurrence of resistance. The child is free to express himself or herself without fear of evaluation or retaliation. Through fantasy, the child can gain a sense of control over the environment without direct competition from others. Finally, play therapy is seen as developing both the child's physical and mental abilities.

The selection of the play media is an important part of the therapy. Gumaer (1984) notes that toys should be durable, inexpensive, and safe. They should be versatile (e.g., clay, paints) so that children may use them in a number of ways. Toys should encourage communication between the child and therapist (e.g., telephones, puppets). Some toys should be selected for their ability to elicit aggression such as a toy gun or a soldier doll. Finally, toys should be relatively unstructured; items such as board games or books leave little room for creativity. In addition to the toys already mentioned, Axline (1947) commonly employs a set of family dolls, a nursing bottle, trucks and cars, and, if possible, a sandbox and water.

Play therapy has expanded to include a number of settings, participants, and techniques (Phillips & Landreth, 1995). Ginott (1961) developed a method that provides a specific rationale for toy selection and that emphasizes the importance of limit setting. Dreikurs and Soltz (1964) use play therapy that emphasizes the natural and logical consequences of a child's behavior. Myrick and Haldin (1971) describe a play process that is therapist directed and shorter in duration than Axlinian therapy, thus making it more practical for use in school settings. For further study, the reader is directed to *The Handbook of Play Therapy* (Schaefer & O'Conner, 1983), which describes specific techniques such as family play and art therapy, as well as play therapy directly tailored to such childhood disturbances as abuse and neglect, divorced parents, aggression, learning disability, and mental retardation.

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FAMILY THERAPY PLAY PSYCHOTHERAPY WITH INDIVIDUALS WITH DISABILITIES

PLURALISM, CULTURAL

Cultural pluralism is a sociological concept that refers to the dual enterprise of acceptance and mobility within the mainstream, majority culture while preserving the minority cultural heritage. Cultural pluralism is seen by many as the most desirable cultural milieu and has been promoted in a variety of settings, including education and employment.

The term is recognized in special education in relation to the work of Mercer et al. (Mercer & Lewis, 1979) in the assessment of mental retardation. Mercer has argued that past efforts in assessment and placement in special education programs for mildly mentally retarded children have failed to recognize the pluralistic nature of American society. In addition to the mainstream Anglo cultural, Mercer has proposed that Black, Hispanic, and other cultures need to be recognized and their norms and mores accepted as equivalent to Anglo norms and mores. Mercer attempts to equate these groups' performance on intelligence tests by developing pluralistic norms. According to Mercer (Mercer & Lewis, 1979), traditional intelligence tests developed and normed on the White majority only measure the degree of Anglocentrism (i.e., relative adherence to White middleclass values) in the home when used with minorities. To accommodate other cultures, principally Black and Hispanic, Mercer developed a set of regression equations to equate

the IQ distributions of each ethnic group. Mercer hopes to promote cultural pluralism in special education by equating the relative proportions of each ethnic group in special education programs. Mercer believes that by equating these distributions, the stigma associated with special education placement will be evenly distributed, leading to greater tolerance and acceptance of alternative cultures.

The cultural competence movement in teacher education has grown considerably in recent years in terms of legislative support (IDEA, Part H in particular) and with the development of instruments such as the Pluralism and Diversity Attitude Assessment (PADAA) instrument, which assesses preservice attitudes of educators (Stanley, 1997). Cultural competence is becoming a good for special and regular education.

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STAFF

CULTURAL BIAS IN TESTING CULTURAL/LINGUISTICALLY DIVERSE STUDENTS DISPROPORTIONALITY SYSTEM OF MULTICULTURAL PLURALISTIC ASSESSMENT

POLAND, SPECIAL EDUCATION IN

Special education in Poland has a long history. In 1817, the Institute of Deaf-Mute and Blind was established in Warsaw. In 1922 Maria Grzegorzewska (1888-1967) established the Institute of Special Education, which conducted research and trained teachers. In 1924 a special education section of the Polish Teachers Association was established (Kirejczyk, 1975). In 1976 the National Institute of Special Education was reorganized into the Graduate School of Special Education.

In the 1950s programs for the mentally retarded were segregated into 120 self-contained schools. In the 1960s there were 331 special classes within elementary schools with an enrollment of over 5000 youngsters. By the 1970s the number of such classes increased to 698, with an enrollment of nearly 11,000. Currently, there are over 250 special schools in Poland, in addition to a considerable number of special classes within public schools.

Handicapped pupils in Poland are educated in special preschool facilities, special elementary schools, special vocational schools, residential boarding schools, and rehabilitation and therapeutic facilities; they also receive home

instruction (Belcerek, 1977). Various levels of interaction of exceptional children within the mainstream of education are also provided (Hulek, 1979), e.g., regular programs with some supplemental instruction, special classes within regular schools (there are presently over 1100 such classes for the mildly handicapped within the Polish public schools and 57 within the vocational schools), selected activities within regular schools, and special schools in the vicinity of regular schools, with cooperative programs.

The intellectually subnormal population in Poland has been estimated to range from 1.3 to 1.87 percent of the general population. Polish psychologists are using IQs in their classification of the mentally retarded. The ranges of the levels of classification are similar to the AAMD classification system. In addition to health examinations, psychological and social-developmental examinations are also given. An evaluation for the purpose of special class placement consists of a detailed classroom observation, educational evaluation, and psychological and medical evaluation. Structural classroom observation usually lasts 1 school year. Additionally, a detailed anecdotal record of the child's activities is maintained. The record includes a description of the role of the parents and the extent of their cooperation with the school. Detailed records with samples of the child's performance are sent to the child study team as additional information. Slow learners and children who do not show good educational progress are directed to prevocational classes at 14 or 15 years of age. Curriculum in Polish special schools consists of the study of the Polish language, geography, music, history, and nature.

Special educators in Poland prefer the term therapeutic pedagogy, or special pedagogy, rather than defectology, a term widely used in Russia. The mildly retarded attend 8 years of basic special school, followed by 3 years of specialized vocational training. A new 10-year curriculum for the mentally retarded recommends the following areas of training and education: adaptation and social living, language stimulation, arithmetic, visual-motor tasks, music, physical exercise, technical-practical activities, and prevocational training. Training goals and objectives for the severely handicapped include physical development and acquisition of manual skills, development of self-help and everyday activity skills, development of basic information, appropriate interpersonal relationships, and prevocational training.

Elska (1985) reported that vocational curriculum for the mildly handicapped consists of two periods per week in grades 1 through 4, four periods in grade 4, and six periods in grades 5 through 8.

Within the system of special education exist numerous vocational schools, e.g., 248 schools with a 3-year curriculum, 5 with a 4-year, and 6 with a 5-year.

Special education teachers in Poland are prepared at 4-year teacher's training institutions, which they enter after graduation from high school. Some experienced teachers of subjects enter universities that have a special education teachers' training program. Since 1973, in addition to the

National Institute of Special Education, special education teachers are also prepared at 11 universities (Belcerek, 1977). In 1977 the Polish Ministry of Education opened post-graduate studies in special education at the Graduate School of Special Education in Warsaw. The areas of study at the school include diagnosis and assessment of exceptionalities and the study of deaf, hard-of-hearing, chronically ill, and socially maladaptive children. Special educators are also trained at the Graduate School of Education in Krakow.

Guidelines for the training of special educators have been developed by the special education team of the Pedagogical Science Committee of the Polish Academy of Sciences (Hulek, 1978). Guidelines recommend that a student in special education become familiar with teaching non-handicapped and subsequently handicapped children; teachers should cooperate with various agencies and institutions outside the school; and teachers should continuously be upgrading their education after graduation by attending in-service classes.

Special education studies in Poland are published in *Informator Szkolnictwa Specjalnego* (Bulletin of Special Education), *Nowa Szkoła* (New School), *Szkoła Specjalna* (Special School), and *Educacja* (Education; formerly *Badania Oświatowe*, Educational Research).

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- politics of exclusion. The primary decision makers were school officials who excluded from the public schools students with special needs requiring services not provided to the majority of students (Copeland, 1983). The grounds for exclusion tended to be observably inappropriate or disruptive behavior, rather than rigorous identification of the nature of students' needs or impediments to learning. Parents typically acquiesced in such decisions without questioning the denial of public school resources to their children.
- A minority of the excluded students were kept at home, while the majority were referred to publicly or charitably supported residential institutions, often at some distance from their homes. There is little evidence to suggest that either local government authorities or school officials sought to establish locally situated residential institutions. Presumably, they sought to avoid the tax burden that might be incurred owing to the high costs of providing for severely impaired students.
- By the beginning of the twentieth century, state-supported systems of residential institutions had emerged, with annual budgets and bureaucracies to administer them and ensure implementation of state regulations (Lynn, 1983). The institutions tended to specialize in one particular type of handicap. Funding formulas varied according to labeled disabilities. Children and youths with special needs were often improperly classified and placed because of inadequate evaluation and subjective if not prejudicial stereotypes (Kirp & Yudof, 1974). Few students with disabilities transferred from one institution to another, and few permanently exited the institutions of initial placement to enter public schools. There was little coordination among different institutions. Many were, in fact, in competition with each other for scarce state resources.
- Organized advocacy groups tended to lobby state legislatures individually on behalf of their particular clients (Lynn, 1983). Public policies were differentiated by type of handicap and servicing institution, advocates and clients, and implementing bureaucracies. They also varied from state to state. The overall pattern, however, was for the major portion of special needs students, funds, and service delivery systems to be located outside the public school systems.
- Around the turn of the century forces began to emerge that would contribute toward the inclusion rather than the exclusion of special needs students from public school systems (Sarason & Doris, 1979). Refinements in evaluation technology facilitated the identification of the special needs of students with disabilities and suggested management and instructional methods appropriate to them. As a result, there was a widespread increase in the number of special classes within public schools (though outside the mainstream of regular students). State and federal legislative bodies enacted programs and provided funds for such classes. Parent advocacy groups and associations of special educators pressed for increased outlays to meet the needs of specific categories of children and youths with disabilities.

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POLITICS AND SPECIAL EDUCATION

Through the middle of the twentieth century, the politics surrounding special education can be characterized as the

Since services for different disabilities incurred different costs, there are indications that various funding formulas may have had a significant effect on local school policies and practices (Lynn, 1983). The proportion of students labeled as having particular disabilities varied from district to district and among states, often in relation to variations in the amounts of funds that could be obtained for specific handicaps. It also varied in relation to the type of diagnostic instruments used, the type of specialists in the school, and the type of specialized services already provided. The politics of inclusion were thus influenced by local practices and political configurations and maneuverings of special education interest groups, legislators, and bureaucracies.

Although emerging special education policies, funds, programs, and practices may not have always matched the needs of special education students, their legitimacy was increasingly accepted, and they provided the leverage for progressively including special needs students within the public schools. By 1975 mandatory legislation that provided for the education of special needs students had been passed in all but two states. By that time, the states' financial contribution had risen to more than half the total revenues allocated to special education. By 1979 approximately 140 different federal programs serving the handicapped had been enacted. By the early 1980s, localities and special districts were contributing a total of \$5.8 billion; states \$3.4 billion; and the federal government a total of \$804 million (Lynn, 1983).

However, it became clear as support for special education advanced, that two separate systems had developed: one outside the public schools, the other inside. Parent advocates now moved to expand the one that had been established within the public schools by pressing for geographic, social, and educational inclusion of special needs students within the system. These efforts contributed to the exodus of the majority of special education students from state-run residential institutions into the public schools, and to considerable cost shifting from the former to the latter.

The legal basis for this shift came from landmark court decisions establishing the rights of special education students to free and appropriate public schooling (*Watt v. Stickney*, 1970; *Diana v. State Board of Education*, 1970 and 1973; *PARC v. Pennsylvania*, 1972). The Fourteenth Amendment guarantees of due process and equal protection were invoked to affirm the rights of special needs children to the free public schooling offered to other children. The U.S. Constitution was applied to protect these students from discriminatory public school practices in the same manner in which it had been applied to protect minority group students in such decisions as *Brown v. Board of Education* in 1954.

While court action gave significant impetus to recognition of the rights of access of students with special needs to public schools, it did so by declaring prior school policies and practices unconstitutional. Yet such determinations tended not to specify what was or would be judged constitutional.

Rather, the courts began to act as umpires, ordering plaintiffs and defendants to negotiate compromises that would be acceptable to both and not unconstitutional (Kirp, 1981). Their role was to set up a structured, adversarial process within state and local school systems in which the courts would act as mediators rather than law-givers. The process would thus be open-ended in terms of its duration, given the lengthiness of legal proceedings, and unpredictable in terms of its possible outcomes.

The debates and conflicts as to placement of students with disabilities, as well as services to be provided them, spread to the federal arena as well, where advocates sought to apply the inclusionary principles of court decisions to congressional enactments. These advocates rode on the coattails of the civil rights movement and the Civil Rights Act of 1964. They encountered countervailing forces similar to those that hampered civil rights activists in their efforts to obtain federal enactments and implement them through the federal system. The movement and the act and its numerous amendments sought to eliminate discriminatory practices by public schools that had denied students geographic, social, and educational inclusion because of their ethnicity, national origin, sex, or impoverishment (Bordier, 1983).

They provided the U.S. Congress with a model for a major legislative enactment designed to protect the rights of special needs students. Passed in 1975, the Education for All Handicapped Children Act, PL 94-142, affirmed their right to a free, appropriate public education in the least restrictive environment; required the identification, evaluation, and placement of students with special needs according to an individual educational plan (IEP); and guaranteed parental rights of participation in educational decisions concerning their children.

Under PL 94-142, the federal government was to pay a graduated percentage of average per pupil expenditures by public elementary and secondary schools, starting with 5 percent in 1979 and culminating in 40 percent by 1982. Implementation of the legislature was nominally nonmandatory. However, most school districts followed suit, presumably because they would have been hard pressed by the parents of special needs students if they did not seek to obtain available federal funds. Furthermore, an earlier law, Section 504 of the Vocational Rehabilitation Act of 1973; forbade discrimination against handicapped students in programs receiving federal financial assistance. Under 504, school districts were routinely required to sign compliance statements affirming that they did not discriminate against students on the basis of race, national origin, sex, or handicap. Since the law was initially interpreted to mean that failure to sign compliance statements could jeopardize receipt of federal financial assistance, compliance (at least on paper) via these statements became the norm.

Program guidelines and regulations of federal implementing agencies such as the Department of Health, Education, and Welfare reflected court decisions and congressional

enactments and established compliance machinery within the department (later the Department of Education) and the Justice Department. The Office of Civil Rights was established to coordinate the compliance activities of the federal agencies involved. While this machinery has not been shown to have had a significant impact on educational practices, it provided an institutional and legal context for the politics of inclusion at state and local levels.

By the middle 1980s, at the end of the first Reagan presidency and at the beginning of the second term, funding for implementation of PL 94-142 was curtailed. The law and its regulations were weakened by congressional interventions and Department of Education actions designed to lessen the federal role in education and to devolve social sector responsibilities (including education in general and special education in particular) to the states.

However, because PL 94-142 had assigned significant responsibilities and funds for implementation to state authorities, by the early 1980s, the latter had already adopted laws and regulations reflective of the principles and the delivery system the federal government had mandated earlier. Such legal frameworks, created at state levels, remained in force even after the federal law itself was weakened in the 1980s. Furthermore, state and local authorities had voted to increase expenditures in order to comply with PL 94-142.

When cutbacks in funding occurred at the federal level, and signs of backlash against rapidly increasing expenditures for previously underserved groups appeared at local and state levels, advocates seeking to protect the rights of special needs students used these policies and funding allocations as precedents to justify continuing aid to special education. The role and responsibilities of state and local authorities became established independent of federal laws and regulations. Local school systems followed suit, and the progressive inclusion of special education students proceeded, geographically, socially, and educationally, in more depth than ever anticipated (Brantlinger, 1997).

The enrollment of special needs students increased significantly. Schools formalized their identification, evaluation, and referral procedures, and included new participants in the process. These included committees on the handicapped, appointed by local school boards; parents and their counsels; new categories of special educators and clinicians; "regular" teachers, administrators, and ancillary personnel who had not previously had responsibility for special needs students; and multidisciplinary evaluation teams. The earlier politics of inclusion that affected the federal court system and the federal government had thus significantly increased the number of participants in the politics of inclusion at the local level. Their participation was focused on the legally specified, formalized procedures that court decisions and legislative enactments had established to improve educational services provided to students with special needs.

In the meantime, the signs of a new movement in the

field of special education appeared; this would engender new policy approaches designed to integrate a whole spectrum of institutions providing services to students with disabilities, including but not limited to school systems (Copeland, 1983). The needs of special education students for services beyond those provided by public schools had become increasingly apparent, and new service providers outside the schools had emerged. The institutions that provided these services, and the funding sources on which they drew, were separate from the public schools.

Interinstitutional cooperation and coordination was needed, but it would require the development of policies, regulations, and funding formulas that were complementary. For example, agencies dealing with public welfare (e.g., social services, aid for dependent children, foster care, Medicaid), health (e.g., maternal and child health), mental health/retardation/developmental disabilities, vocational rehabilitation, and corrections needed to work more closely. As the public schools incorporated the major portion of the children and youths who had previously been assigned to residential institutions, it became clear that the schools could not provide all the collateral services that these students would require.

Linking these services required interagency cooperation (as mandated by IDEA) and the development of coalitions of advocacy groups to formulate legislation and programs to link their budgets, staffs, and services into an integrated delivery system of which the public schools would be a part. It also required intricate planning that would continue to promote the inclusion of special needs students within the educational mainstream while at the same time requiring the differentiation of these students according to their needs for external services. This blueprint for the 1990s and beyond would require interagency policy making; programming, and budgeting. It would provide an ambitious and complex political agenda for the advocates of special and general education, as well as external social services for children and youths.

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HISTORY OF SPECIAL EDUCATION

INCLUSION

INDIVIDUALS WITH DISABILITIES EDUCATION ACT OF

2004 (IDEIA)

MAINSTREAMING

POLYDIPSIA

Polydipsia is excessive drinking of water. It is often associated with water intoxication and polyuria (excessive urination). It is essential to distinguish polydipsia that is biologically based from psychogenic polydipsia (Singh, Padi, Bullard, & Freeman, 1985). Most cases of polydipsia are not due to psychogenic factors (Wright, Schaefer, & Solomons, 1979). Psychogenic polydipsia involves the consumption of excessive quantities of water over a brief time period that is often associated with water intoxication. Water intoxication symptoms include headache, excessive perspiration, and vomiting, as well as more severe symptoms such as convulsions and even death (Blum, Tempey, & Lynch, 1983). Psychogenic polydipsia in children is reported to be rare and there is a lack of epidemiological studies available reporting reliable incidence. Among psychiatric patients, the incident is reported to range from 6.6 to 17.5 percent (Singh et al., 1985).

Biological determinants of abnormal thirst and polydipsia include diabetes, hypercalcemia, congestive heart failure, intracranial disease, potassium deficiency associated with renal disease, and meningitis (Chevalier, 1984). Another physical form of polydipsia during infancy occurs when infants are fed on demand with an overly diluted formula (Horev & Cohen, 1994; Wright et al., 1979).

Psychogenic polydipsia is associated with a wide spectrum of psychopathology ranging from mild personality disorders to severe psychosis (Singh et al., 1985). Various explanations for psychogenic polydipsia have been provided including the psychodynamic concept of an oral personality (Singh et al., 1985) or an obsessive-compulsive personality (Wright et al., 1979). It may also result from a behavioral condition such as a conditioned response (Linshaw, Hipp, & Gruskin, 1974).

There is presently no single treatment recommended in the literature for psychogenic polydipsia. The treatment would depend on the aspects of the condition relative to a particular case. Polydipsic children with central nervous system (CNS) involvement would be at

risk for learning disorders and possibly special education services. Those with more severe psychological disorders may be in need of special programs for behavioral handicaps.

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MEDICAL HISTORY

MEDICAL MANAGEMENT

PONCE DE LEON, PEDRO DE (1520–1584)

Pedro de Ponce de Leon, a Spanish Benedictine monk, is credited with creating the art of teaching the deaf. His method, as described by early historians, consisted of teaching the student to write the names of objects and then drilling the student in the production of the corresponding sounds. Whether lip reading was taught is not known, nor from the surviving accounts of his work can it be ascertained whether Ponce de Leon used any signs in teaching his students. It is known that his methods were successful with a number of children.

After Ponce de Leon's death in 1584, no one continued his work, but it is probable that his success, which received much publicity, influenced the development of methods to educate the deaf in Spain in the early seventeenth century.

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PORCH INDEX OF COMMUNICATIVE ABILITIES

The Porch Index of Communicative Ability (PICA) is designed to assess and quantify gestural, verbal, and graphic abilities of aphasic patients. As a reliable standardized instrument, the PICA provides quantitative information about a patient's change in communicative function and enables the examiner to make predictive judgments relative to amount of recovery (Porch, 1971).

The PICA is a battery of 18 subtests; 4 verbal subtests ranging from object naming to sentence completion; 8 gestural ranging from demonstrating object function to matching identical objects; and 6 graphic on a continuum from writing complete sentences to copying geometric forms. For consistency, 10 common objects are used within each subtest (e.g., toothbrush, cigarette, fork, pencil). A multidimensional binary choice 16-point scoring system is used to determine the degrees of correctness of a patient's response. The scoring system judges responses according to their accuracy, responsiveness, completeness, promptness, and efficiency. Administration time is variable, usually averaging approximately 60 minutes.

Prior to administering the PICA, participation in a 40-hour workshop for test administration, scoring, and interpretation is required. Examiners must complete a rigid testing protocol to insure a high degree of reliability. The PICA is a valuable clinical tool for providing valid and accountable descriptions of an aphasic patient's current and future level of communicative performance.

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APHASIA

DEVELOPMENTAL APHASIA

PORTAGE PROJECT

The Portage project was first funded in 1969 as a model home-based program by the Bureau of Education for the Handicapped under the Handicapped Children's Early Education Program (HCEEP). In rural Portage, Wisconsin, the project's staff traveled to the homes of children to help parents learn how to work with children in a home setting (Lerner, 1985). The experimental edition of the Portage project was developed during the first 3 years of the project

and was published by McGraw-Hill in 1972. The revised edition (1976) was developed by Susan Bluma, Marsha Shearer, Alma Froham, and Jean Hillard (Bailey & Worley, 1984; Bluma, et al., 1976; Thurman & Widerstrom, 1985). The project was a developmental, criterion-referenced, behavioral model that employs precision teaching to evaluate a child's developmental level and to plan an educational program for children from birth to 6 years of age. The complete guide came in three parts: a checklist of behaviors on which to record an individual child's developmental progress; a file card listing possible methods of teaching these behaviors; and a manual of directions for use of the checklists, card files, and various methods of remediation. The assessment procedure was administered in 20 to 40 minutes. The behavioral checklist consisted of a 25-page color coded booklet that contains 580 developmentally sequenced behaviors.

Ages were listed at 1-year intervals. The first 45 items were grouped under infant stimulation. Many of the items in this development area were activities that a parent or teacher performed with a child. These behaviors served as a guide for teaching infants up to 4 months. The area of socialization evaluated the young child's interactions with other people. A systematic pattern of language development that focuses on content and the form that was used to express that content was outlined in the checklist. The self-help category defined those behaviors that enabled the child to care for himself or herself in feeding, dressing, and toileting. The motor area was primarily concerned with the coordinated movements of the large muscles of the body. For each of the 580 items, there were curriculum cards that provide teaching suggestions. These cards were in a card file and were color coded to match corresponding sections in the checklist.

For a home-based program, children were assigned to a home teacher who spent about an hour and a half a week with each child assigned. Instruction during the remainder of the week was the responsibility of the parent. Prescriptions were modified according to each child's individual progress from week to week. Three new behavior targets were identified each week, and it became the parents' responsibility to provide instruction on these behaviors between the home teacher's visits. The home teacher collected data before and after instruction and helped parents with their teaching skills by modeling techniques and allowing parents to try the skills each week.

The success of the Portage model was seen in its wide dissemination and replication. Over 30 replications across the United States have been reported as well as international recognition (Mittler, 1990). The project staff provided training and technical assistance to the replicated sites while the sites provided input regarding changes and additions. (Bluma et al., 1976; Southworth, Burr, & Cox, 1980; Thurman & Widerstrom, 1981).

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- Turnbull, Turnbull, Shank, & Leal, (1999). O'Neill et al. (1997, p. 8) writes that the outcome of behavioral support is "not just to define and eliminate undesirable behavior but to understand the structure and function of those behaviors in order to teach and promote effective alternatives." Positive behavioral support focuses on strategies that are designed to promote and sustain durable and generalizable change that positively affects an individual's access to the general education curriculum, community settings, preferred activities, and preferred persons within and across environments (Horner et al., 1990).
- Carr et al. (2002) notes that the application of positive behavioral support has several critical features, including: (1) the development of a comprehensive plan that specifically focuses on the person of concern's quality of life; (2) consideration is given to a life span perspective that is taking into account long-term and comprehensive change plans, procedures, and supports; (3) application of scientific principles to real-life situations; (4) active involvement of the consumer and critical stakeholders as part of a collaborative process of providing positive behavioral support; (5) increased emphasis on use of socially valid methods; (6) application of strategies that promote systems-level change; (7) a focus on the use of proactive and preventative strategies, instead of using reactive and aversive methods to address chronic and persistent problem behavior; (8) incorporation of multiple data collection methods for both evaluation and practice; and (9) incorporation of multiple perspectives and paradigms into plans of behavioral support. These features include research and practice grounded in applied behavior analysis (Baer, Wolf, & Risley, 1968; Sulzer-Azaroff & Mayer, 1991), principles from the normalization and inclusion movements (Wolfensberger, 1983), and strategies associated with person-centered planning and self-determination (Kincaid, 1996; Martin, Marshall, & De Pry, 2005).
- Positive behavioral support planning is predicated on an accurate functional assessment. Functional assessment is a term that describes a process for gathering information about the factors that predict and/or maintain chronic or persistent problem behavior. Data from indirect and direct functional assessments are used to develop and implement comprehensive behavior support plans, including data of any setting events, immediate antecedents or triggers, and consequent events that are hypothesized to maintain the problem behavior. Summary statements are developed from this data and are organized into a competing behavior path analysis (see O'Neill et al., 1997). A behavior support plan is then collaboratively developed that delineates environmental modifications, curricular adaptations, and instructional strategies for teaching replacement responses that serve the same function of the problem behavior, but are more socially acceptable given the individual's home, school, and work environments. O'Neill et al. concludes that the ultimate purpose of the functional assessment

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HOMEBOUND INSTRUCTION PARENT EDUCATION

POSITIVE BEHAVIORAL SUPPORT

Positive behavioral support (PBS) is a dynamic and collaborative process for implementing environmental and lifestyle changes as part of a comprehensive plan of behavioral support for individuals with chronic or persistent problem behavior. Behavior support plans are based on data from functional assessments that result in environmental modifications and instructional procedures that the person of concern, teachers, family, and support personnel can implement in order to increase positive alternative behaviors, decrease problem behaviors, and increase attributions of self-determination, inclusion, and independence for the person of concern (Carr et al., 2002; De Pry, 2006; Field, Martin, Miller, Ward, & Wehmeyer, 1998; O'Neill et al., 1997; Sugai & Horner, 1994; Turnbull, & Turnbull, 1990). In other words, "positive behavior includes all those skills that increase the likelihood of success and personal satisfaction in normative academic, work, social, recreational, community, and family settings. Support encompasses all those educational methods that can be used to teach, strengthen, and expand positive behavior and all those systems change methods that can increase opportunities for the display of positive behavior" (Carr et al., pp. 4–5).

Behavioral support planning is an evidenced-based and nonaversive approach for reducing challenging behaviors that utilizes systems-level change and individual skill development (Horner, et al., 1990; Sugai & Horner, 1994;

is to “increase the effectiveness and efficiency of behavior support plans” (p. 65).

Because schools are dynamic and complex social systems, policies and procedures need to be in place that promote positive behavioral support across settings, faculty, staff, and students in our schools (Sugai & Horner, 1994). This method, often referred to as schoolwide positive behavior support, provides a continuum of behavioral support for all learners, with additional support being available for students with targeted needs and intensive/individualized behavior support needs (Sugai et al., 2000). Sugai (1996) has identified four major schoolwide positive behavior support systems that should be considered when addressing the behavioral support needs of all learners in schools. These systems include schoolwide behavioral support systems (all students, all staff, and all settings), specific setting behavioral support systems (hallways, bathrooms, cafeteria, playground, parking lot), classroom-specific behavioral support systems (instructional classroom management), and individual student behavioral support systems (targeted and function-based support). Each of these systems incorporate (1) procedures for teaching expected behaviors to all students, (2) procedures for monitoring and evaluating student progress using both formative and summative assessments, and (3) procedures for accessing local behavioral expertise (e.g., behavior support team or school-based PBS leadership team) so that teachers can receive assistance and support in the implementation of the schoolwide program, including functional behavioral assessment and individualized behavioral support planning (Colvin, Kame'enui, & Sugai, 1993; Sugai & Horner, 1994).

Positive behavioral support has also received increased attention in the area of family-based behavioral support (Lucyshyn, Dunlap, & Albin, 2002). Specific strategies and methods for providing ongoing behavioral support have been implemented for persons with autism, developmental disabilities, and emotional and behavioral disorders (Dunlap & Fox, 1996; Lucyshyn, Horner, Dunlap, Albin, & Ben, 2002; Whaley, 2002) across a variety of home, school, and community settings. Application of function-based support in home environments has been shown to be an effective strategy for addressing chronic and persistent problem behavior (Lucyshyn, Kayser, Irvin, & Blumberg, 2002; Wacker, Peck, Derby, Berg, & Harding, 1996). In addition, an increased interest in collaborative family support strategies and collaborative research practices has been documented in the extant literature (Turnbull & Turnbull, 1996).

O'Neill et al. (1997) offers four considerations for building effective behavioral support plans, including (1) behavioral support plans should describe *our* behavior, that is, the changes that teachers, family, and support personnel will make within and across environments to support the person of concern; (2) behavior support plans should always build upon the results of comprehensive functional assessments; that is, the behavior support team should always incorpo-

rate both indirect and direct functional assessment data as a means to understand the purpose or function that the problem behavior serves for the individual; (3) behavior support plans should be technically sound and include strategies that make the problem behavior irrelevant, ineffective, and inefficient by implementing empirically validated behavioral principles across settings, persons, and time; and (4) behavior support plans should fit the setting where they will be implemented by taking into account the values, time, and resources of those that will be asked to implement the procedures, including the person of concern.

In conclusion, positive behavioral support is a process for creating responsive environments that take into account the preferences, strengths, and needs of the person of concern by promoting systems-level change across environments and by using instructional strategies that teach the individual effective alternatives to the behaviors of concern (Sugai & Horner, 1994; Turnbull et al., 1999). These strategies are based on an extensive literature found in the study of applied behavior analysis, strategies associated with functional behavioral assessment and individualized behavior support planning, practices associated with the normalization and inclusion movements, and values found in both person-centered planning and self-determination movements (Carr et al., 2002). Positive behavioral support has specific applications for individuals with chronic or persistent problem behavior (O'Neill et al., 1997), as well as systems-level change and evidence-based strategies that are used in school environments (Sugai et al., 2000) and in home and community settings (Koegel, Koegel, & Dunlap, 1996; Lucyshyn, Dunlap, & Albin, 2002).

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POSITIVE BEHAVIORAL SUPPORT, SCHOOLWIDE

POSITIVE BEHAVIORAL SUPPORT, SCHOOLWIDE

Schoolwide Positive Behavior Support (SWPBS) is a systems approach for establishing the social, culture and behavioral supports needed for schools to be effective learning environments for all students. Based on principles of behavioral theory and applied behavior analysis, SWPBS focuses on the school as the "unit of analysis" by considering how resources, activities, and initiatives are organized, implemented, and evaluated. Because the accurate adoption and sustained use of evidence-based practices are considered essential in effective schools, SWPBS emphasizes systems factors, like team-based coordination and action planning, data-based decision making, active administrator participation, and ongoing and long-term professional development. The Office of Special Education Programs (OSEP) Center on Positive Behavioral Interventions and Supports has indicated that "Positive behavioral support is not a new intervention package, nor a new theory of behavior, but an application of a behaviorally-based systems approach to enhancing the capacity of schools, families, and communities to design effective environments that improve the fit or link between research-validated practices and the environments in which teaching and learning occurs" (1999, p. 7). Positive behavior support (PBS) is the outcome of the systematic integration of behavioral science, practical interventions, social

values, and a systems perspective (Carr et al. 2002; Sugai et al. 2000).

Features

School adoption of SWPBS is associated with a number of characteristics. First, implementers of SWPBS use four important criteria to guide their decision making. Attention is focused on the careful selection, definition, and acknowledgment of *outcomes* that are valued by significant stakeholders (e.g., students, families, community members), described in measurable terms, based on local data and input, and used to guide intervention selection and measure progress. Priority is given to the identification, adoption, adaptation, and sustained use of evidence-based *practices* that are linked to achieving desired outcomes. Information or *data* systems are established to define outcomes and guide evaluation of implementation efforts and practices (e.g., discipline referrals, specialized support requests, academic achievement patterns). Before any practice is put in place, *systems* for supporting users and implementers of the practice must be established (e.g., professional development, resources, coaching, coordination). Together these elements serve as the core operating features of SWPBS (see Figure 1; Sugai & Horner, 2002).

Second, the SWPBS approach is based on a prevention logic that has been adopted from the public health literature (Larson, 1994; Moffitt, 1994). A three-tiered continuum of positive behavior support is emphasized for all students (see Figure 2; Colvin, Kame'enui, & Sugai, 1993; Sugai & Horner, 2002; Walker et al., 1996). At the primary level, all students and all school staff members across all school settings are involved in a universal prevention strategy that consists of (1) clear purpose statement for the importance of maintaining classroom and school climates, (2) small number of positively stated behavioral expectations, (3) formal yearlong process for teaching and practicing the behavioral expectations, (4) continuum of ongoing procedures for en-

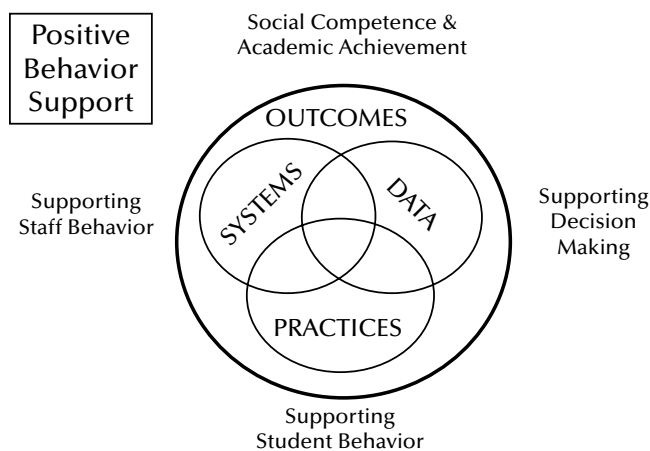


Figure 1 Four elements of SWPBS

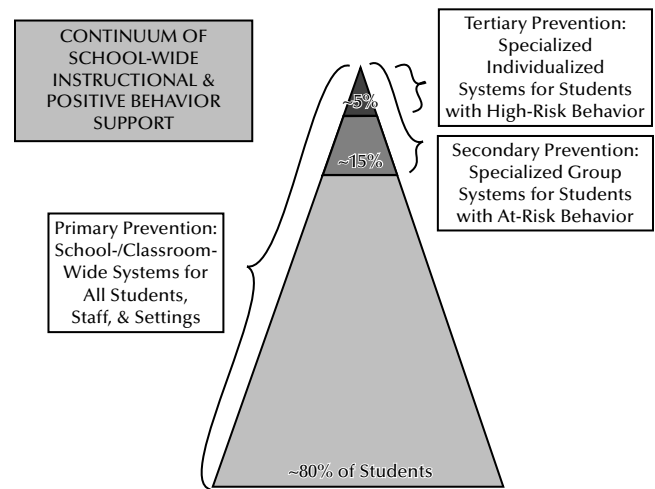


Figure 2 Continuum of PBS

couraging student use of these behavioral expectations, (5) continuum of clearly defined consequences for discouraging rule-violations, and (6) regular routines and procedures for monitoring student behavior and intervention effectiveness. At the secondary prevention level, more intensive strategies are put in place for those students who do not benefit from primary prevention strategies. These strategies are applied similarly across these students and focus on increasing teacher monitoring and reinforcement and teaching and fostering self-management skills. At the tertiary level, specially designed, function-based, and individually implemented and monitored interventions are emphasized (e.g., special education, alternative programming).

Third, although procedures for responding to rule violation and problem behaviors are considered necessary, SWPBS emphasizes the teaching of prosocial skills at the individual, classroom, and schoolwide levels. The teaching of social skills is similar to the procedures for teaching academic skills: (1) define, tell, show, and/or explain; (2) arrange regular opportunities to practice to fluency; (3) monitor continuously and acknowledge regularly; and (4) modify and adapt based on student performance (Colvin & Sugai, 1988). Similarly, student learning of social skills is evaluated along the same phases of academic learning; that is, acquisition, fluency, maintenance, generalization, and adaptation (White & Haring, 1980).

Finally, implementation of SWPBS is guided by a systemic or organizational approach (Colvin et al., 1993; Lewis & Sugai, 1999). Before any practice is adopted and implemented, a schoolwide leadership team with representation from within and outside the school is established to coordinate accurate and sustained implementation. The team uses local data from students, family members, and staff to guide the development of a contextually relevant action plan that has clear and measurable outcomes and evidence-based interventions that are linked to achieving those outcomes. After the plan is developed and approved,

the team prepares the staff for the implementation of the action plan interventions. Throughout the process, the team monitors information on the effects of intervention on student behavioral and academic performance, and the extent to which staff are consistently, accurately, and comprehensively using interventions. From the results of these evaluations, the team makes adaptation to the action plan to improve the effectiveness, efficiency, and relevance of the interventions.

Implementation Indicators and Outcomes

Depending on the focus of the action plan, the implementation of SWPBS can be associated with a range of outcomes; for example, improvements in discipline referral and suspension patterns, increased opportunities for student learning and teaching instruction, improvements in classroom and school climate, and increases in the proportion of students meeting state academic standards when combined with effective instruction (Sugai & Horner, 2002).

In addition, the successful implementation of SWPBS interventions is associated with other indicators. For example, more than 80 percent of a random sample of students can name the schoolwide positive expectations and give a behavioral example of what that expectation looks like in a typical school setting, and indicate that an adult has acknowledged them for a display of a behavioral expectation in the last week. Similarly, more than 80 percent of the school staff can state the schoolwide expectations and have taught the skills to the students. The SWPBS leadership team has met at least monthly to review their data and evaluate the implementation of their action plan. When these teams meet, the school administrator is an active participant. For additional information on SWPBS go to the OSEP Technical Assistance Center on Positive Behavior Interventions and Supports web site at <http://www.PBIS.org>.

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POSITIVE BEHAVIORAL SUPPORT

POSITIVE PRACTICE

Positive practice is a behavior change technique whereby a misbehaving individual is required to practice correct or appropriate behaviors repeatedly. The term positive practice is frequently used as a synonym for overcorrection, a punishment technique (MacKenzie-Keating & McDonald, 1990). In fact, positive practice is actually a subcomponent of overcorrection. With overcorrection, a misbehaving individual is required to overcorrect the environmental effects of his or her inappropriate act and/or repeatedly practice correct forms of relevant behavior in situations where the misbehavior commonly occurs (Foxx & Bechtel, 1982a). The first part of the overcorrection procedure outlined is commonly referred to as restitution and the latter portion of the procedure is often labeled positive practice. Foxx and Bechtel (1982a) have recommended the terms restitution and posi-

tive practice be dropped and replaced by overcorrection for purposes of conceptual clarity and communication.

The concept of positive practice has been the central feature of numerous intervention techniques such as theft reversal (Azrin & Wesolowski, 1974), cleanliness training (Azrin & Foxx, 1971), and social apology training (Carey & Bucher, 1981). Two common misconceptions about positive practice, however, exist. The first is that positive reinforcement is part of positive practice. This is probably owed to the fact that many people associate the performance of appropriate behaviors solely with the delivery of positive reinforcers. In overcorrection, the performance of appropriate behaviors is elicited by graduated guidance (verbal and physical) from a therapist, not positive reinforcement (Carr, 1997). The second misconception is that positive practice is similar to negative practice (Dunlap, 1930), a procedure whereby an individual repeatedly practices an inappropriate behavior. Clearly, positive practice is conceptually and pragmatically antithetical to negative practice.

By design, positive practice is a consequence to be used as an aversive stimuli following the occurrence of an inappropriate behavior. Therefore, when the presentation of positive practice results in the reduction of a response in the future, it functions as a punishment procedure. The research literature documents that positive practice, or more accurately overcorrection, can produce large, fairly enduring reductions in inappropriate behavior. Overcorrection procedures have been used with several response classes of behaviors (e.g., aggressive-disruptive behaviors, self-stimulating behaviors, self-injurious behaviors, personal hygiene, social interactions), populations (e.g., mentally handicapped, behaviorally disordered, undersocialized children and adults), and settings (e.g., schools, homes, and institutions). Foxx and Bechtel (1982b) provide an extensive review of the outcomes and side effects of overcorrection, and detailed guidelines for the use of overcorrection.

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APPLIED BEHAVIOR ANALYSIS BEHAVIOR MODIFICATION NEGATIVE PUNISHMENT OVERCORRECTION

POSITIVE REINFORCEMENT

Behavioral psychology, in particular operant conditioning theory, is based on the supposition that behavior is maintained by its consequences. A consequence that leads to an increase in the frequency of a behavior is called a reinforcer. Conversely, a consequence that results in a decrease in the frequency of a behavior is called punishment.

The principle of positive reinforcement has two parts: (1) if in a given situation a person's behavior is followed close in time by a consequence, then (2) that person is more likely to exhibit the same behavior when he or she is in a similar situation at a later time. This consequence is referred to as a positive reinforcer and is roughly synonymous with the concept of reward.

The person credited with first experimentally investigating the effects of rewards on learning is E. L. Thorndike. In 1898 he began seminal work with hungry cats who learned to escape from a cage to acquire food. After many investigations, Thorndike (1911) conceptualized the law of effect, which in part stated that if a stimulus was followed by a response and then a satisfier, the stimulus-response connection would be strengthened. Skinner (1938, 1953) followed up on Thorndike's work and chose the term positive reinforcer in place of satisfier because he felt satisfier was clumsy and not appropriate for a scientific system of behavior. With the work of Skinner and others such as Premack (1959), the principle of positive reinforcement has become the cornerstone of behavior theory and technology.

The application of positive reinforcement is deceptively simple. Two important components in the successful application of positive reinforcement are the selection of a reinforcer and the schedule for delivering the reinforcer. Some stimuli are positive reinforcers for virtually everyone. For example, food is a reinforcer for almost anyone who has not eaten in several hours; money also is generally reinforcing. It is very important, however, to understand that one can

actually determine if a stimulus is reinforcing only after it has been administered contingent on the appearance of a desired behavior. In other words, a stimulus is defined as a reinforcer only by its effect on behavior. Failure to select a stimulus that is reinforcing is one of the most common errors in implementing a behavior change program.

The relationship between a behavior and its consequence is called a contingency. Contingencies can operate continuously (i.e., the consequence follows every occurrence of the target behavior) or intermittently (i.e., the consequence follows only a portion of the occurrences of the target behavior). Most contingencies operate on intermittent schedules (e.g., variable ratio, variable interval, fixed ratio, fixed interval). Each reinforcement schedule has been demonstrated to have a different effect on behavior. In general, continuous schedules are used effectively to develop a new behavior, whereas intermittent schedules are used effectively to increase and maintain a behavior already in a person's repertoire. Ratio schedules generally produce high rates of response, and interval schedules produce lower rates of response. In summary, the selection of a stimulus that is reinforcing and the schedule by which it is administered will determine the strength of the positive reinforcement.

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APPLIED BEHAVIOR ANALYSIS BEHAVIOR MODIFICATION

POSITRON EMISSION TOMOGRAPHY

Positron Emission Tomography, also referred to as PET imaging or a PET scan, is a diagnostic process that involves the acquisition of physiologic images based on the detection of radiation from the emission positrons. Positrons are tiny particles omitted from a radioactive substance administered

to the patient. The subsequent images of the human body developed with this technique are used to evaluate a variety of diseases. The PET scanner is a large machine that looks like a donut. Within the machine are multiple rings of detectors that record the emission of energy from the radioactive substance injected into the individual and permit an image of the body to be obtained. While lying on an examination table, the individual is moved through the hole of the machine. The images are displayed on a computer monitor. Before the examination begins a radioactive substance is produced in a machine called a cyclotron, then attached to a natural body compound, usually glucose but sometimes water or ammonia. Once this substance is administered to the individual, the radioactivity localizes in the appropriate areas of the body and is detected by the PET scanner. A radioactive substance is usually administered through an existing intravenous line or an inhaled gas. It takes approximately 30 to 90 minutes for the substance to travel through the body and accumulate in the tissue under study. Different colors or degrees of brightness on a PET image represent different levels of tissue or organ function. For example, healthy tissue uses glucose for energy. It then accumulates some of the tagged glucose which shows up on the PET images. However, cancerous tissue uses more glucose than normal tissue and therefore it accumulates more of the substance and appears brighter than normal tissue on a PET image.

PET scans are particularly useful in detecting cancer and examining the effects of cancer therapy by characterizing biochemical changes in the cancer. The scans can be performed on the whole body or specific parts of the body. PET scans of the heart can be used to determine blood flow to the heart muscle and help evaluate signs of coronary artery disease. PET scans can also be used to determine if areas of the heart that showed decrease function are alive rather than scarred as the result of a prior heart attack. Combined with other studies, PET scans allow differentiation of nonfunctioning heart muscle from heart muscle that would benefit from corrective procedures. PET scans of the brain are used to evaluate individuals with memory disorders of an undetermined cause, suspected or proven brain tumors, or seizure disorders that are not responsive to medical therapy and therefore candidates for surgery. Because the probe is very short lived, radiation exposure is low. The substance amount is so small that it does not affect the normal processes of the body.

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DIFFUSION TENSOR IMAGING MAGNETIC RESONANCE IMAGING SPECT

POST-INSTITUTIONALIZED CHILD PROJECT

One of the most devastating examples of early childhood neglect and deprivation can be seen in the experiences of children living in some foreign orphanages. It is known that maternal deprivation, neglect, and severe malnutrition in the early lives of children put them at greater risk for growth failure and developmental delays in the early years. Little is known, however, about long-term growth and development of these children. More and more of these children are being adopted by families within the United States. Individual reports suggest that these children may experience long-term growth failure, continued developmental delays and abnormalities related to the onset of puberty. Definitive data are not yet available.

Physicians from Emory University School of Medicine, The Marcus Institute for Development and Learning, and The Hughes Spalding International Adoption Evaluation Center are researching the potential problems that children adopted from international orphanages who are exposed to severe deprivation and/or neglect may struggle with as they grow. Currently, the research is focusing on children adopted from Romania. Efforts to expand this research may be taken.

Families who have experience with a child adopted from an orphanage or institution from any country and who are interested in assisting with the development of knowledge in the field are encouraged to contact the project.

Further information can be obtained on the Internet at <http://www.emory.edu/PEDS/ENDO/orphan/or> or <http://www.adopt@oz.ped.emory.edu>

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POST-INSTITUTIONALIZED CHILDREN

A wide variation of scenarios are envisioned when a child is described as neglected. Tangible resources that are considered primary needs of a child such as food, shelter, and clothing may not be provided by caretakers. Services such as appropriate medical care or education may be withheld. In addition, less tangible neglect may occur in the form of lack of emotional interaction with caregivers and/or lack of developmental or intellectual stimulation.

This emotional neglect, which is a product of social, developmental, and intellectual understimulation, may result from a variety of early environmental situations. The parent who is too busy or too overwhelmed by his or her own issues

may not take the time to provide stimulation and attention that the child needs. Likewise, a child who has been moved from one overcrowded foster care home to another may also be exposed to such neglect. One of the most devastating examples of neglect and deprivation can be seen in the experiences of children living in some foreign orphanages.

After the fall of the Romanian communist regime in 1989, a disturbing system of state-run child care was discovered. The government was housing up to 300,000 children in an orphanage system. These orphanages became a dumping ground for either the country's most severely diseased and damaged children or for those that were without a home or family. Children were often placed into orphanages that provided minimal amounts of clothing and food, and little medical attention. The orphanages were also generally devoid of personal contact, with ratios of children to caregivers often as high as 60 to 1. Children were left unattended, with contact only for adding food to the bottle suspended above the crib and occasional diaper changes.

Children raised in such understimulating, neglectful, and even abusive environments may suffer a host of adverse consequences. The following discussion will focus on the severely neglected and sometimes abused children; in particular, children with a history of institutionalization. The discussion will address the neurobiological and physiological effects of such neglect, the stress on family systems, and recommendations for educational modifications.

In the 1940s, scientists such as Rene Spitz, William Goldfarb, and John Bowlby described the effects of deprivation, severe neglect, and institutionalization on the well-being of children. At this early time, emotional attachment between the caregiver and infant or young child was already described as important for the child's future development. In the 1960s and early 1970s, definitive work was done to show that the effects of institutionalization on a child was linked to social impairment in the development of that child. This work was carried out by Drs. Sally Province and Rose Lipton. In addition, animal studies at this time demonstrated the effects of sensory deprivation on the animal's well-being. The famous experiments with monkeys performed by Dr. Harry Harlow are an example of such important work.

As these research findings became more widely credited, the orphanage system in the United States became less accepted in favor of the currently used foster care system. Other countries, however, continued to place unwanted children in institutions. Many families in the United States are now adopting these post-institutionalized children from countries within Eastern Europe, China, Korea, and elsewhere. Many of these children are suffering from numerous psychological and developmental disorders.

Studies suggest that approximately 80 percent of children adopted from foreign institutions show some developmental delay at the time of entry into the United States (Johnson et al., 1992). Long-term studies of these children are few due to

the relatively short time that the majority of these children have been in the United States. One study demonstrated that after approximately 3 years in the United States, 30 percent of the children continued to demonstrate language delays, 28 percent demonstrated delayed fine motor skills, and 25 percent demonstrated delayed social skills (Groze & Ileana, 1996).

The exact mechanism in the brain for the cause or etiology of these developmental problems is usually unknown. Children in an orphanage system are at risk for factors before birth, at the time of birth, and after birth that may contribute to the injury of the brain causing developmental difficulties.

Alcohol use is prominent in many of the countries, especially in Eastern European countries. This substance can have a profound negative impact on the developing neurologic system of the developing fetus.

Fetal alcohol syndrome (FAS) is a combination of clinical characteristics including growth retardation, abnormal facial features, and neurocognitive or neurobehavioral effects. But alcohol may also have a partial effect on the fetus. The child may then have only one or two of the above characteristics in a pattern that has been labeled partial fetal alcohol effects (PFAE).

Stress may also have a negative effect on the developing brain. The exact mechanism for this is unknown. Some postulated theories suggest negative effects are due to excess cortisol on the developing brain (Carlson, 1997). The brain's limbic system may also be involved. It is thought that even young infants, when exposed to severe environmental deprivation, neglect, or abuse can manifest negative developmental and psychological consequences (Frank, 1996).

Whatever the cause may be, some of the diagnoses these children may have include symptoms that include Post-Traumatic Stress Disorder (PTSD), attachment disorders, functional mental retardation, learning disabilities, sensory integration abnormalities, depression, anxiety, behavioral disturbances, personality disorders, FAS, PFAE, Attention-Deficit Hyperactivity Disorder (ADHD) and others. Children may also be diagnosed with Pervasive Developmental Disorder (PDD) and/or autism. Dr. Ronald Federici, a developmental neuropsychologist who specializes in the care of post-institutionalized children, proposes a unique type of autism sometimes seen in these children. He terms this autism: an acquired syndrome.

Unique medical problems can also be seen in these children. These may include infectious diseases, gastrointestinal problems, and heart conditions. A common medical problem that may be related to the negative effects on the brain is growth retardation. Some research has also pointed to an increased risk of early puberty onset (Proos et al., 1991).

It is very important that a child adopted from such an institution be followed by medical specialists who have experience and expertise in some of the medical, developmental, and psychiatric issues that these children and

their families face. A primary pediatrician who is willing to work with subspecialists, educators and service providers is valuable. Other specialists who may be needed include a pediatric infectious disease specialist, a developmental pediatrician, a pediatric gastroenterologist (stomach doctor), a pediatric endocrinologist (hormone doctor), and a pediatric psychiatrist, among many others. The primary pediatrician, however, can coordinate appropriate referrals as needed.

The adoptive parents and siblings may have difficulty integrating the child into the family. Unfortunately, some agencies organizing such adoptions may promise a perfect child who just needs a little TLC. Families may become very frustrated if the child continues to demonstrate delays or behavioral difficulties.

Likewise, the child may have great difficulty adapting to his or her new environment. Culture shock is common. A modestly decorated home in the United States may be as stimulating as a crowded, colorful amusement park to a post-institutionalized child. Some things that we take for granted may be threatening or scary to the child who has been deprived. These things may include new foods; the introduction to warm and hot water at bath time; car rides; being outside; hugs, kisses, and other forms of physical affection. Professional assistance from individuals such as pediatric psychologists and/or pediatric and family counselors who are familiar with foreign adoption issues may be of great benefit to such families and children.

As for educational recommendations, Debra Schell-Frank, special education consultant for the Parent Network for the Post-Institutionalized Child, strongly recommends that initially these children be considered as special needs children. Parents, educators, and physicians must work together to evaluate the child's strengths and weaknesses and to offer appropriate intervention services early with close monitoring in order to help the child develop to his or her maximum potential.

Resources

The Parent Network for the Post-Institutionalized Child (PNPIC)

Tel: (724) 222-1766

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E-mail: PNPIC@aol.com

The Hughes Spalding International Adoption Evaluation Center

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E-mail: adopt@oz.ped.emory.edu

Help for the Hopeless Child: A Guide for Families, by Dr. Ronald S. Federici.

Children with Backgrounds of Deprivation: Educational Issues for Children Adopted from Institutions, by Dr. Debra Schell-Frank.

The above two books may be obtained through the PNPIIC.

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POSTLINGUAL DEAFNESS

Postlingual deafness is a general term for profound hearing loss that occurs after the normal acquisition of language and speech. It is also called acquired or adventitious deafness. Those who sustain this type of hearing loss are referred to as deafened rather than deaf.

Postlingual deafness is differentiated from prelingual deafness. The latter interferes with the normal acquisition of language and speech, and frequently affects educational achievement to such an extent that deaf students leaving special schools at the age of 18 are often 7 or 8 years behind their hearing peers (Thomas, 1984). A postlingually deafened

child has learned to speak before losing his or her hearing. The child has the memory of the sound and rhythm of speech and has acquired vocabulary and grammar normally. If the child had normal hearing, even for a short time, the outlook is improved (Webster & Elwood, 1985) however not necessarily predictive of cerebral symmetry (Szelag, 1996). The education of postlingually deaf children should encourage creative thinking and verbal expression, and include vocabulary enrichment, aural rehabilitation, and the opportunity for speech refinement and maintenance (Northcott, 1984).

The etiology of acquired or adventitious hearing loss may be familial, noise-induced, by accident or illness, or, in the case of adults, the result of old age (presbycusis). The onset of a hearing loss is sometimes so gradual that it may go unnoticed for a long time. However, any hearing loss, whether acquired gradually or suddenly, that is extensive enough to interfere with the normal communication process creates a myriad of problems so complex that coping with the hearing world becomes difficult (Giolas, 1982). Formal speech-reading lessons are required in most instances. Sometimes individual hearing aids and cochlear implants (Langereis, Bosman, van Olphen, & Smoorenburg, (1997) can supplement residual hearing to facilitate communication.

Children who lose their hearing between the ages of 3 and 12 sometimes complete their education in programs for the deaf and later become the leaders and spokespeople of the deaf community. Children who lose their hearing at ages older than 12 are more likely to remain with their former hearing friends and not join the community of deaf adults (Jacobs, 1980). Modern technological devices such as hearing aids, auditory trainers, TDDs (telecommunication devices), and television decoders that display captions, are of great assistance in the education of deaf and deafened children.

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DEAF DEAF EDUCATION

POVERTY, RELATIONSHIP TO SPECIAL EDUCATION

Poverty alone does not cause learning and behavior problems. However, poverty is associated with a variety of environmental variables that could result in the manifestation of learning and behavior problems in children. Mental retardation, learning disabilities, and emotional disturbances have all been linked to environmental circumstances associated with poverty. The vast majority of individuals with mental retardation fall into the mild category, and the majority of these children come from lower socioeconomic status families (MacMillan, 1982). Although difficult to confirm, poverty has also been linked to learning disabilities (Reid & Hresko, 1981). There is evidence that supports the lower socioeconomic environment's contribution to learning problems. Furthermore, many of these same environmental circumstances have also been linked with emotional disturbance and social maladjustment (Smith, Price, & Marsh, 1985).

Although the connection between poverty and special education is easy to establish, it is difficult to separate the many variables and determine which is the most critical to the child. This is because many of the variables are interwoven at points in the child's development. Malnutrition, poor maternal health, inadequate prenatal care, a child's poor health, homelessness (Masten, 1992) and general environmental deprivation demonstrate complex interrelationships that make it difficult to isolate a single and specific causal agent. Nevertheless, all of these factors associated with poverty have been shown to have an influence on an individual's cognitive and behavioral development.

A lower socioeconomic environment harbors many potential hazards for a developing child (Robinson & Robinson, 1976). For instance, children from these environments are exposed to greater health risks, and their health care is generally inferior to that of children from higher socioeconomic families; nutritional deficiencies are more common in poor families owing to a lack of food or adequate nutritional intake; and the use of standard English in this environment is generally poorer than it is in more affluent families.

Child rearing also takes a somewhat different form in many poor families than in middle-class families. Low-income families tend to have more children and fewer adults. Discipline in lower-income families tends to rely on punishment, especially physical punishment; middle-class families tend to rely more on reasoning, isolation, and appeals to guilt. Poor families also tend to delay training their children for independence until they are able to learn rapidly, which provides few opportunities for learning how to make mistakes without disgrace.

Another negative aspect of this environment is a restricted range of sensory stimulation. Low-income families are usually associated with restricted developmental stimulation because there are fewer objects for the child to react to (Smith, Neisworth, & Hunt, 1983). This restricted range of sensory stimulation will hinder a child's interaction with physical and social environments by providing fewer behavioral cues.

An inadequate home environment that fails to interest children and promote learning is still another environmental factor associated with poverty. It is common to find less value placed on education in lower income homes. Parents existing at the poverty level may have experienced poor academic progress themselves and dropped out of school early. They may not see education as a vehicle for their child's escape from a similar situation. After all, education did not help them escape poverty. In addition, the parents may be more concerned with day-to-day survival than the perceived value of education. Consequently, when their children ask questions; they may fail to respond or regard that behavior as an interruption.

The environmental factors mentioned are not meant to be inclusive. There are many other factors associated with poverty that also influence learning and behavior. But these factors do point out that poverty is an underlying cause for many of the negative environmental variables associated with handicapping conditions. In some cases (e.g., poor maternal nutrition and health care), these factors can affect the child's development prenatally, resulting in an organic origin for the disability (e.g., damage to brain cells). In other cases, poor environmental circumstances cause children to be ill-prepared to start school. These children lack the experiences that are common to children of higher income families and can be overcome by preservice intervention programs (Barnett, 1998; Evans, Okifuji, Engler & Bromley, 1993).

Even though these poverty factors underlie many of the negative variables associated with handicapping conditions, it must be remembered that these learning and behavior problems apply to only a small number of children. The large majority of children living in poor environments will show normal development. While these factors can cause cognitive and behavioral problems in some children, they produce no ill effects in others.

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CULTURAL DEPRIVATION
CULTURAL-FAMILIAL RETARDATION
SOCIOECONOMIC IMPACT OF DISABILITIES
SOCIOECONOMIC STATUS

**POWER AND RESEARCH IN
SPECIAL EDUCATION**

The scientific method has evolved in such a way as to allow researchers to observe phenomena, question, formulate hypotheses, conduct experiments, and develop theories. In hypotheses testing, one compares scientific theories in the form of a statistical hypothesis (H^1) versus a null hypothesis (H^0). According to Kirk (1984), the "statistical hypothesis is a statement about one or more parameters of a population distribution that requires verification" (p. 236). An example is

$$H^1 : m > 80,$$

where the mean score of a population of children is hypothesized to be greater than 80 after participating in a remedial reading program. The statistical hypothesis is thus based on the researcher's deductions from the appropriate theory and on prior research. The null hypothesis involves formulating a hypothesis that is mutually exclusive of the statistical hypothesis. In other words, if the researcher believes that children's mean reading scores will be greater than 80 after participating in a reading program, a mutually exclusive hypothesis by which to test the researcher's premise is given by

$$H^0 : < 80.$$

If the null hypothesis is rejected, by default the statistical or alternative hypothesis is assumed to be true but not proven; it is retained as the most likely truth.

In hypothesis testing, rejection or nonrejection of the null hypothesis is based on probability. Incorrect decisions can occur in two ways. If the null hypothesis is rejected when it is in reality true, this is defined as a Type I error. Should the null hypothesis fail to be rejected when it is in fact false, a Type II error is said to have occurred. The following Table displays the possible decision outcomes.

Power is a basic statistical concept that should be taken into consideration in the design of any research study that samples data for inferential purposes. Rejecting the null hypothesis is dependent on whether the test statistic falls within a specified critical region at a particular level of significance, or alpha level (α). The probability of committing a Type I error depends on the alpha level specified. The alpha level also determines the probability of correctly accepting the true null hypothesis ($1 - \alpha$). The probability of committing a Type II error is labeled β ; the probability of a correct rejection is based on $1 - \beta$, or the power level. Figure 1 illustrates the relationship among the four outcomes α , $1 - \alpha$, β , and $1 - \beta$, or power. β and power are affected by (1) the size of the sample; (2) the level of significance (α); (3) the size of the difference between m_1 and m_0 ; (4) the size of the population; and (5) whether a one- or two-tailed test is used. One method of increasing the power of a statistical test is to increase the sample size. Figure 2 demonstrates this relationship in a correlational study.

Using power in an a priori fashion enables the researcher to compute the sample size necessary for testing the null

Decision Outcomes for Hypothesis Testing

		True State	
		H_0 True	H_0 False
Decision	Fail to reject H_0	Correct acceptance	Incorrect acceptance (Type II error)
	Reject H_0	Incorrect rejection (Type I error)	Correct rejection

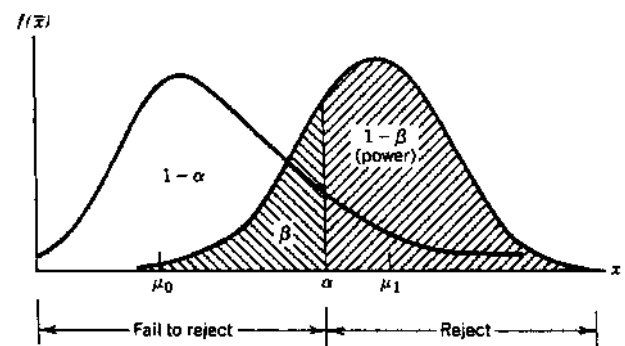


Figure 1 Relationship among power, alpha, one minus alpha, and beta

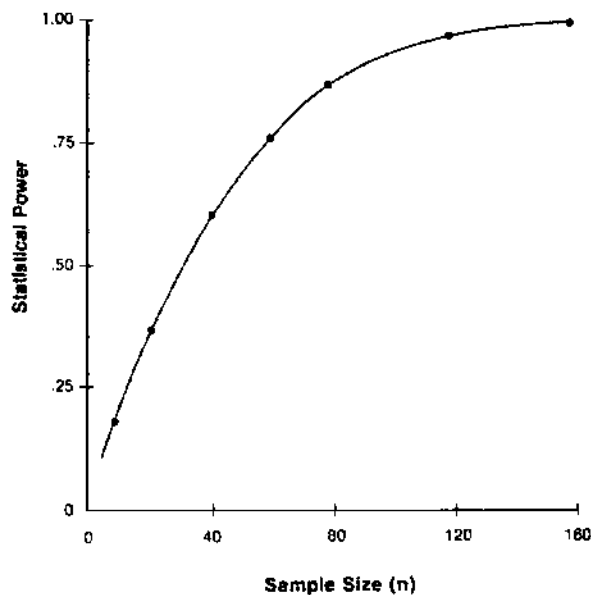


Figure 2 Relationship between sample size and statistical power for detecting a correlation of approximately .30 when $p < .05$

hypothesis, given a level of power and alpha. Often, a researcher is faced with a restricted or small sample size on which he or she wishes to determine the power level. Furthermore, in many research situations, as in evaluating special education programs, assessing the impact of a new teaching technique, or exploring the effectiveness of new medication compared with existing therapies, power allows the experimenter to consider, while in the planning stages, what effect size is needed to detect a significant difference. Similarly, the use of two-tailed tests, greater alpha levels, and small population standard deviations contribute to studies with more powerful results. However, it is worthy to note that the cost of committing a Type I error can be as damaging as committing a Type II error. Adopting a new diet program for the treatment of attention deficit children by falsely deciding that the diet is more effective than behavior therapies and medications is as serious as denying the new diet plan any effectiveness as a springboard for future research. Although power is of central consideration in research design and planning, its contribution must be weighted with other important statistical, methodological, and practical facets of the study.

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RESEARCH

PRACTICAL INTELLIGENCE

See INTELLIGENCE, PRACTICAL

PRADER-WILLI SYNDROME

First described in 1956 by Swiss physicians A. Prader, A. Labhart, and H. Willi, Prader-Willi syndrome (PWS) is a complex disorder and a rare birth defect. Common characteristics include hypotonia in early infancy, hypogonadism, short stature, and, after age 2, excessive weight gain and obesity (Cassidy, 1984). Perhaps the most outstanding characteristic of PWS is the individual's constant preoccupation with food and the compulsion to be eating all the time (Otto, Sulzbacher, & Worthington-Roberts, 1982; Pipes, 1978). This voracious craving for food finds PWS victims often exhibiting unselective and bizarre food behaviors such as eating spoiled meat, rotten vegetables, and/or cat food as well as foraging, stealing, or gorging food (Bottel, 1977; Clarren & Smith, 1977; Dykens & Cassidy, 1996; Otto et al., 1982).

The excessive appetite of PWS victims is not the only factor contributing to their obesity. They seem to require fewer calories than the average person of comparable age to maintain weight (Nardella, Sulzbacher, & Worthington-Roberts, 1983; Neason, 1978). In order to lose weight, further reduction in caloric intake is necessary, sometimes restricting the person to a 1000-calorie or less daily diet plan (Cassidy, 1984; Nardella et al., 1983).

Characteristics of PWS individuals usually include erratic and unpredictable behavior such as stubbornness, outbursts of temper, depression (Watanabe & Ohmori, 1997), and even rage (Otto et al., 1982). Personality problems, behavioral disorders, and emotional problems are frequent though not consistent findings in people with PWS (Cassidy, 1984). Many of the more aggressive behaviors escalate out of anger or desire for food.

Current research indicates that an aberration in a portion of chromosome 15 may be the cause of PWS (Nardella et al., 1983). However, PWS is not a high-risk condition and is most likely a noninherited chromosome defect (Neason, 1978). Another prevailing theory is that PWS is due to a defect within the hypothalamus and thus PWS victims never reach a sense of satiety (Clarren & Smith, 1977).

Mental retardation, particularly in the borderline to moderate range, has been considered to be an integral part of the syndrome (Cassidy, 1984; Neason, 1978). However, recent reports by Holm (1981) indicate that for many of these people, cognitive functioning is more typical of learning disabilities. That is, the child has strengths in several areas and weaknesses in others, unlike a retarded child, who tends to be developmentally delayed across skill areas. Academic weaknesses are commonly found in arithmetic,

particularly in the understanding of time and the handling of money, and in writing. Reading and language commonly are mentioned as academic strengths. Holm (1981) sees the intellectual functioning of the PWS individual as a central nervous system disorder.

Because of its rarity, insufficient evidence exists on the social and emotional consequences of having PWS. However, there is no question that those afflicted with the disorder have sufficient intelligence to recognize the social stigma obesity has in our society (Cassidy, 1984). At the present time there is no known cure or treatment for PWS. The critical component of any program, however, is the constant monitoring of caloric intake. If the weight of the individual with PWS is not kept under control, death may occur at an early age from complications associated with extreme obesity.

Educational intervention for individuals with PWS should begin in early childhood with a program that assists and supports parents and children in managing eating behaviors. Food and nutrition management must be the first and foremost objective of any school program. Deliberate and calculated attempts by the teacher must be made to rid the classroom of any and all food, including pet food. Alternate reward and reinforcement systems other than food reinforcers such as candy must also be instituted. All school personnel who come in contact with the child (particularly lunchroom aides) must be made aware of the child's condition and the consequences of additional caloric intake. The child should be encouraged to stay away from food at all cost.

Physical activity designed to enhance body awareness and activities that encourage social interaction should be stressed and deliberately planned in any class with a PWS child. Academic weaknesses should be addressed as well, and particular attention should be paid to eliminating or modifying temper tantrums or extreme stubbornness by using a behavior-modification approach (Cassidy, 1984). Secondary-level students should be prepared in independent living skills such as math in daily living and vocational/occupational skills, with an emphasis on increasing the child's responsibility for weight control. Competitive employment is rare and most adults are employed in noncompetitive structured workshops and centers. At all times, in any school or workshop program, students with PWS must be watched to prevent their consuming other people's leftovers and food items.

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CHROMOSOMES, HUMAN ANOMALIES, AND CYTOGENETIC ABNORMALITIES

PRAGMATICS AND PRAGMATIC COMMUNICATION DISORDERS

Pragmatics is the study of language use independent of language structure, rules, and principles which relate the structure of language to its use (Duchan, 1995; Duchan, Hewitt, & Sonnenmeier, 1994). The rules and principles of pragmatics define who can communicate (talking, writing, signing) what, to whom, how, when, where, and why. Pragmatics includes verbal and nonverbal dimensions of communication and the rules are often implicit and dynamic. Competence in pragmatics includes the development of scripts (the stereotypical knowledge structures that people have for common routines) and schemas (hierarchical cognitive categories of synthesized scripts; Hedberg & Westby, 1993; Nelson, 1998). Social, academic, and employment schemas and scripts are important in development. The social scripts of eating at different fast-food restaurants and eating at a full-service restaurant contribute to the schema of "eating out." The academic scripts of studying for a multiple choice test, studying for an essay exam, and making a diorama contribute to the schema "doing homework." The employment scripts of knowing and following the "rules" of a job setting and knowing and using the "politics" of a job setting contribute to the schema of "employment success."

Communication registers, or codes, occur as people adapt to the social and communication demands of situations (Lane & Molyneaux, 1992). Registers are differences observable within speakers, across situations. The different registers allow speakers to convey their social position relative to that of their listeners while simultaneously communicating a message. Registers range from "frozen," which is the most distant, noninteractive form of communication code, to "intimate," a form that excludes public information. Restricted codes are the context-dependent modes of communication used with close friends and coworkers when details are unnecessary. Precise, detailed, context-independent statements that anyone can understand are elaborated codes.

Pragmatic theory suggests that every communication act has three aspects: (1) the illocutionary intent of the sender to accomplish some goal, such as to inform, request, persuade, or promise; (b) the locutionary dimension, i.e., the actual words and sentence structure of the communication act; (c) the perlocutionary effect that the act has on the receiver (e.g., did the receiver comply with the request, understand the information?; Haynes & Shulman, 1998; Hulit & Howard, 1997; Lane & Molyneaux, 1992; McLaughlin, 1998; Nelson, 1998; Owens, 1996; Paul, 1995; Wallach & Butler, 1994).

Communication style is a type of language variation that distinguishes individual speakers in different contexts. A formal, grammatically correct style, *acrolect*, would be appropriate for academic or some employment situations; a conversational, everyday style, *mesolect*, would be appropriate for conversations and some types of employment; and *basolect* (vulgarity) may be used by some individuals in certain situations (Muma, 1978).

Pragmatic communication disorders include violating the verbal, nonverbal, oral, and written rules of communication styles, codes, or scripts. They can interfere with social and academic aspects of the communication-learning process. Pragmatic communication disorders are seen frequently in persons with developmental or acquired disorders such as autism, blindness, deafness, language-learning disorders, mental retardation, and emotional-behavioral disorders (Duchan, 1995; Duchan et al., 1994). Individuals who are gifted and talented may also manifest pragmatic communication problems. Pragmatics of communication varies from culture to culture and should not be confused with a pragmatic language disorder.

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PRECISION TEACHING

Precision teaching, a measurement system developed by Ogden R. Lindsley at the University of Kansas in the mid-1960s (McGreevy, 1984; Potts, Eshleman, & Cooper, 1993), involves daily measurement and graphing of student performance for the purpose of formative evaluation. Frequency of behavior (the number of occurrences divided by minutes of observation) is charted on the Standard Behavior Chart, a graph designed to highlight changes in frequency. Data are evaluated daily to determine if changes in curriculum are necessary to promote learning and progress toward performance goals (or, in the language of precision teaching, aims).

There are four steps in precision teaching. First, a precisely stated behavior or pinpoint is selected. An example of a pinpoint statement is "see word/say word." Next, frequencies of correct and incorrect responses are obtained and charted on the Standard Behavior Chart. Third, curricular events are modified to change performance in the desired direction. Finally, the graph is evaluated and instructional decisions are made according to trends in the data. Of course, these final two steps are repeated as necessary until progress allows for the attainment of aims.

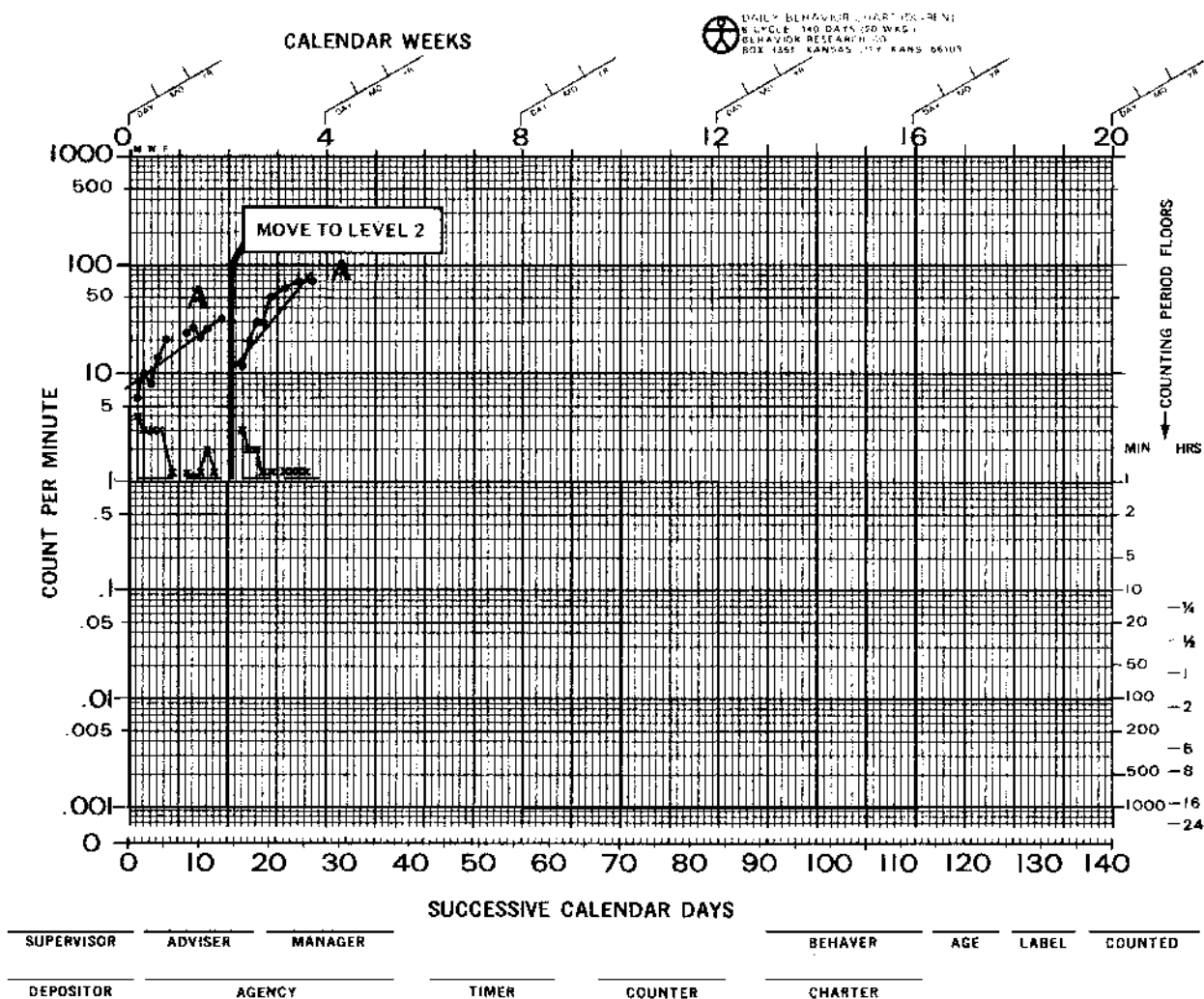
The Standard Behavior Chart is a semilogarithmic or equal-ratio graph. Frequency is represented along its vertical axis as Movements/minute (M/m). Equal changes in the frequency of behavior are represented by equal distances along this Y-axis. Thus, the distance between 10 and 20 M/m is identical to the distance between 50 and 100 M/m since both represent a $2 \times$ (times 2) change. In fact, any $2 \times$ change, regardless of where along the Y-axis it occurs, will appear as the same distance on the Standard Behavior Chart. Behaviors ranging in frequency from 1 to 1000 minutes (.001 M/m) to 1000 in 1 minute (1000 M/m) can be represented on the Standard Behavior Chart. The unit along the X or horizontal axis is actual calendar days.

Data are obtained directly through observations of student behavior. For example, word recognition could be measured each day by counting the number of words said correctly and incorrectly per minute of reading. Also, in precision teaching, data are recorded continuously. Once

recording starts, behavior is monitored without interruption until the recording period stops.

One of the principal measures used in precision teaching is celeration (Pennypacker, Koenig, & Lindsley, 1972). Celerations are standard straight line measures describing the trend of graphed data. For example, an upward trend or acceleration in correct responses and a downward trend or deceleration in incorrect responses, describe a desirable pattern. Precision teaching suggests that certain teaching decisions be based on a minimum acceptable celeration toward a performance aim. In practice, if the teacher sees the student's performance drop below acceptable minimums, then decisions are made to change some aspect of the curriculum (White & Haring, 1980). The changes are evaluated to see if restoration of student progress is obtained. Various adjustments are tried until acceptable celerations and progress toward aims are achieved.

The Figure shows examples of correct (•) and incorrect



Daily behavior chart

(x) data points on a standard behavior chart. The lines drawn through the data represent celerations. Various changes in the teaching procedures are indicated by notations on the chart. The correct data are accelerating to the previously chosen performance aim the symbol "A" on the chart. Incorrect responses are decelerating. This pattern is a desirable one showing learning and growth in both accuracy and fluency (Binder, 1996) of performance. If the data change in an undesirable manner—e.g., if frequency correct decelerates and frequency wrong accelerates—then teachers must select a program adjustment and try again (Lindsley, 1971).

Thus the process of precision teaching is an optimistic one. Once responses are precisely defined, observed, and recorded, the elements of a self-correcting instructional system are in place. Teachers may not interpret failure to maintain adequate progress toward an aim as a limitation of the student. Rather, such failure signals a limitation of the existing instructional program. Their ability to solve even the most difficult instructional problems of handicapped learners is limited only by their creativity in developing program adjustments.

The *Journal of Precision Teaching* is dedicated to dissemination of data-based information about human performance and is an excellent resource. The journal is available through Louisiana State University, Special Education, 201 Peabody Hall, Baton Rouge, Louisiana 70803.

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**DIRECT INSTRUCTION
DATA-BASED INSTRUCTION
TEST-TEACH-TEST PARADIGM**

PREHM, HERBERT J. (1937–1986)

A native of Aurora, Illinois, Herbert J. Prehm obtained his BS (1959) in elementary education and psychology from Concordia Teacher's College, River Forest, Illinois, later earning both his MS in 1962 and PhD in 1964 in education and psychology from the University of Wisconsin, Madison.

Trained as an elementary school teacher and experienced as a reading consultant for children with dyslexia, Prehm maintained an interest in the learning problems of children throughout his distinguished career. As a professor of education at various universities for some 20 years, his work primarily concerned the effective teaching of mentally retarded children (Hersh & Prehm, 1977; Prehm, 1967; Prehm & Stinnett, 1970). Prehm's publications regarding the elements necessary for preparation of students in the special education field at the doctoral level was a result of this experience as a teacher and advisor of those entering the profession (Prehm, 1980).

Prehm's later work included instructional strategies for individuals with severe disabilities, with this research resulting in the development of a model allowing for controlled formal investigation of relevant variables, including handicapping condition, race, and age (Zucker & Prehm, 1984). This model was an important tool utilized in studying teaching methods via the use of results of previous investigations.

Among his numerous contributions, Prehm served as assistant executive director of the Department of Professional Development of the Council for Exceptional Children and president of the Teacher Education Division of the Council for Exceptional Children. Additionally, he was a fellow of the American Association on Mental Deficiency (now AAMR) and recipient of the TED-Merrill Award for Excellence in Teacher Education. The book he coauthored with Kathleen McCoy, *Teaching Mainstreamed Students* (1987), was published only a short time after his death in 1986.



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PRELINGUAL DEAFNESS

Prelingual deafness refers to profound hearing loss sustained before language has been acquired. Age at onset of profound hearing loss is a major factor because of its implications for language development. The critical age at onset of profound hearing loss is about 2 years (Quigley & Kretschmer, 1982). Children born deaf, or deafened before the age of 2 years, are prelingually deaf. Deafness is a profound degree of hearing impairment, a bilateral loss of 90 dB or greater on the audiometric scale of –10 to 110 dB (Quigley & Paul, 1984).

Prelingually deaf children rely on vision as their primary channel of communication and language acquisition. Since language plays such an important role in thinking and in conceptual growth (Webster & Ellwood, 1985), prelingually deaf children require special educational programs with emphasis on all the skills related to language and communication.

Prelingual deafness is more than the inability to hear sound. It is a pervasive handicap that, because of its effects on language and communication, has an impact on almost all aspects of child development.

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DEAF

DEAF EDUCATION

SPEECH, ABSENCE OF

PREMACK PRINCIPLE

The original definition of reinforcement (Skinner, 1938; Spence, 1956) was circular. A stimulus could not be identified as a reinforcer until it had been tested and shown to increase the probability of a response. This left behavior modifiers with no a priori method of choosing effective reinforcers. However, Premack (1965) solved this problem of circularity by devising an independent means of determining the reinforcing power of different consequences. Premack found that under certain circumstances, an organism's own behavior can function as a reinforcer. More specifically, a less probable behavior within a person's repertoire can be strengthened by making the occurrence of a more probable behavior contingent on it.

This principle was first demonstrated in an intensive set of experiments in which Premack shifted the probability of animals drinking or running by alternately depriving them of water or activity. When drinking was made a high-probability behavior by depriving the animals of water, drinking reinforced the low-probability behavior of running. Similarly, when running was made a high-probability behavior by depriving the animals of activity, running served as a reinforcer for drinking. In both situations, low-probability behavior was increased by following it with high-probability behavior.

Moving from the animal laboratory to the applied setting is always a difficult transition. Identifying reinforcers by the Premack principle requires assessing the relative probabilities of the reinforcing behavior and the behavior to be changed by counting their rate of occurrence in a free environment. This arduous task seriously limits the usefulness of the Premack principle in applied settings. Fortunately, behavior modifiers have found it adequate to identify high-

probability behaviors by asking a person about preferred activities or by casually observing the person to determine the activities from which he or she derives overt pleasure (Danaher, 1974). Once the preferred behavior is identified, the behavior modifier will allow the person to engage in that behavior only after performing the targeted low-probability or less preferred behavior. Because of this formulation, the Premack principle is sometimes referred to as "Grandma's rule" (Becker, 1971; Homme, 1971) or "you do what I want you to do before you get to do what you want to do."

Preferred activities have been frequently used in special education to reinforce or increase the rate of less preferred activities as demonstrated in the following three examples. First, in a deaf education class, Osborne (1969) allowed students to earn 5 minutes of free time, the preferred activity, for every 15 minutes they remained in their seats, the less preferred activity. Second, Hart and Risley (1968) gave economically disadvantaged children access to recreational materials contingent on the appropriate use of adjectives in spontaneous speech. Third, Kane and Gantzer (1977) showed that in a special class, academically preferred activities could be used to increase the amount of time spent in less desirable academic activities. The Premack principle has been particularly successful in the treatment of feeding disorders and diet maintenance (Amari, Grace & Fisher, 1995; O'Brien, Repp, Williams & Christophersen, 1991).

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BEHAVIOR MODIFICATION OPERANT CONDITIONING POSITIVE REINFORCEMENT

PREMATURITY

Prematurity or preterm refers to infants born prior to completion of 37 weeks gestation. Although the overall survival rate of premature infants has steadily increased with advances in perinatal and neonatal care, the incidence of prematurity has not significantly changed in the past 20 years and remains at about 10 percent of all live births (Spitzer, 1996).

The exact cause of the majority of premature births remains unknown. The cause is hypothesized to be a combination of maternal, paternal, fetal, and environmental factors. Maternal risk factors for prematurity include pregnancy-induced hypertension, antepartum hemorrhage, infection, and premature rupture of membranes. Maternal social factors often contributing to prematurity are low socioeconomic status, age less than 16 or greater than 40 years, history of premature births, history of repeated abortions, non-white race, maternal substance abuse (including cigarettes and alcohol), lack of prenatal care, and poor nutritional status (Spitzer, 1996). Paternal factors include genetic makeup and older age. Fetal factors related to prematurity include presence of congenital anomalies, fetal disease, and multiple gestation. Environmental factors include stress, injury, and exposure to teratogens (Johnson, 1986). The cause of prematurity continues to be elusive, making prediction of premature births difficult.

Gestational maturity is determined by both neurological and physical characteristics (Dubowitz & Dubowitz, 1977). The premature infant's head generally appears large for its small body and the skin is bright pink, wrinkled, and translucent. The eyes remain fused until about 22-25 weeks gestation and after opening appear large for the face. The abdomen looks distended, and genitalia are not fully developed (Merenstein & Gardner, 1998). The fingernails are thin and the body is covered with fine downy hair and a layer of sebaceous skin covering. The preterm infant's arms and legs are thin and muscle tone is poor, causing it to lie in an extended position unless supported against gravity. Reflex movements are only partially developed, and breath-

ing and crying are often spasmodic and weak (Schuster & Ashburn, 1986).

Preterm infants have physiologically immature organ systems that cause many clinical problems. These problems include immature lungs, apnea, hemorrhaging into the brain, infections of the gastrointestinal tract, poor weight gain, inability to maintain body temperature, and infection (Merenstein and Gardner, 1998).

The clinical problems often require intensive management involving a team of healthcare professionals providing multisystem support. This support may include the use of incubators, ventilators, intravenous fluids, and physiologic monitoring. Survival rates are improving, with reports of 61 percent survival of infants born between 23–26 weeks gestation. Of those infants, 6 to 36 percent survived intact without long-term handicapping conditions. The more immature the infant, the greater the incidence and severity of long-term complications. Survival rates improve and incidence of complications diminish rapidly after 26 weeks gestation (Goldsen, 1996).

The long-range sequelae of prematurity are closely associated with both prenatal and postnatal complications and the disruption of the parent-infant attachment process. Long-term sequelae include breathing disorders, retinopathy of prematurity, increased incidence of SIDS, and neurologic impairment leading to sensorimotor and developmental delays (Merenstein & Gardner, 1998).

Preterm infants may develop breathing disorders such as apnea, in which breathing is not regular and rhythmical, or bronchopulmonary dysplasia (BPD), in which the lungs are damaged and infants require supplemental oxygen and breathing support. Another potential complication is impaired vision or blindness associated with retinopathy of prematurity (ROP). Once believed to be caused solely by excess oxygen, ROP is now known to owe to many contributing factors, including the degree of prematurity, nutritional status, and exposure to light (Spitzer, 1996). Serious and sometimes devastating complications arise from intracranial hemorrhage and other forms of hypoxic brain damage. Intracranial bleeding into the ventricular system in the brain is graded in severity from I–IV (I the least damaging, IV meaning bleeding has progressed into the brain tissue itself).

Other potential long-range effects of preterm birth include lack of parent-infant attachment and delays in growth and development. Lack of attachment can be caused by separation, guilt, fear, and poor parenting skills. Attachment can be strengthened by encouraging and supporting early parent-infant interaction and involving parents in the care of their hospitalized child. Teaching parents developmentally appropriate interactions, helping them to understand their infant's cues, and encouraging skin to skin contact all help in the attachment process (Merenstein & Gardner, 1998).

Preterm infants often experience a lag in growth and development. Improved infant formulas and the increased sup-

port of breastfeeding greatly contribute to improved nutrition and growth. Environmental control of light and noise, positioning that provides containment and support, and intervention strategies that avoid overstimulation encourage normal growth and development. Early and regular developmental assessment to detect delays is important to allow for early intervention and improved outcomes for these infants.

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AMNIOCENTESIS
APGAR RATING SCALE
BABY DOE
BIRTH INJURIES
LOW BIRTH WEIGHT INFANTS

PREREFERRAL INTERVENTION

Graden, Casey, and Christenson (1985) state that the goal of a prereferral intervention model "is to implement systematically intervention strategies in the regular classroom and to evaluate the effectiveness of these strategies before a student is formally referred for consideration for special education placement" (p. 378). The prereferral intervention model is intended to prevent unnecessary referrals for psychoeducational testing for purposes of determining eligibility for special education programs. The prereferral intervention model is an indirect, consultative service, and has several advantages as an alternative to the traditional

process of teacher referral, psychoeducational testing, determination of eligibility, and special education placement. It has also paralleled the movement towards inclusion (Wilson, Gutkin, Hugen, & Oats, 1998).

First, while traditional psychoeducational testing assumes the child's problem resides in the child (e.g., a learning disability, low intelligence, or a personality disorder), the prereferral intervention model assumes that the child's problems are a result of the interaction of the child's characteristics with setting and task variables. When those setting and task variables that result in improved child performance are identified through careful observation and problem-solving efforts, modifications can be implemented in the classroom without removing the child from the regular class. Second, in the traditional testing approach, if the child is found ineligible for special education services, a great deal of resources are allocated to the child, but the child does not necessarily benefit from these resources. Third, because some testing does not use instructional data, the recommendations may not have instructional ramifications. Contributing to the problem of the relevance of recommendations is the fact that the problem for which the child is referred often does not show up in the testing situation. For example, a child who is fidgety and has trouble concentrating in the classroom may demonstrate excellent concentration in the one-on-one testing relationship. In this example, the testing results and recommendations would not address the referral problem. Fourth, when special education services are the only assistance available to children with problems, teachers will refer children whose needs could be met in the less restrictive environment of the regular classroom. If consultative help were available to the teacher, the child's needs could be served through an indirect model. Fifth, indirect services serve preventive goals. If teachers can request consultation from a school psychologist or special education teacher-consultant soon after a child's problem becomes evident, more severe problems can be avoided. In the traditional testing model, children who do not qualify tend to get referred again and again by teachers until the problems are severe enough to qualify these children for special education programs. Finally, the teacher develops new knowledge and skills in consultation that will assist in providing for the needs of other children.

Because 73 percent of referred children are placed in special education (Algozzine, Christenson, & Ysseldyke, 1982), referral for testing is a critical point in the referral-testing-determination-placement process. The prereferral interventions model is aimed at increasing the probability that a child referred for testing has needs that cannot be met by modifications in the regular classroom. Graden et al. (1985a) delineate four steps in the prereferral intervention model. These steps occur prior to a formal referral for special education testing. First, the teacher requests consultation from the school psychologist or special education teacher-

consultant. This step may be a requirement or an option for the teacher. Second, the consultant and teacher engage in a problem-solving process that involves specifying the problem, generating alternative interventions, and evaluating the intervention. This step may be repeated. Third, if the interventions tried out during the first consultation are unsuccessful, the consultant and teacher collect additional observational data. The data include an analysis of antecedents and consequences of the child's behavior. These more detailed observations are used to plan interventions that are then implemented and evaluated. If these interventions are unsuccessful, the teacher and consultant refer the child to a child review team that reviews the problem and the data collected. This team may recommend additional data to collect or additional interventions, or it may formally refer the child for psychoeducational testing for purposes of determining eligibility for special education. If the child is referred for testing, the data collected in the prereferral phases are used to select an assessment strategy and to plan for the child's instructional needs.

The prereferral model is a consultative model. The consultant must possess the consultation skills necessary to engage the teacher in a collaborative, problem-solving process to create an open and trusting relationship with the consultee and to guide the teacher in a problem-solving sequence.

Although there have been many studies evaluating the effectiveness of consultation, few of these have evaluated consultation as a systematic strategy for reducing inappropriate referrals for special education testing. An exception is the case study by Graden, Casey, and Bonstrom (1985), they found that four out of six schools that implemented the prereferral model experienced a decrease in referrals for testing and special education placements. The authors suggest that the model was not successful in the other two schools because there was a lack of system support and the model was not fully implemented.

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PRESCHOOL SCREENING CONSULTATION PREVENTION, PRIMARY

PRESCHOOL-AGE GIFTED CHILDREN

Services for gifted children below kindergarten age have received increased attention as a means of encouraging development of the child's potential, stimulating interest in learning, and providing support for parents. Several authors (Fox, 1971; Isaacs, 1963; Whitmore, 1979, 1980) have pointed to lack of support and intellectual challenge in the early years as one source of later underachievement among the gifted. Programs for young gifted children facilitate early interaction between parents and educators that can promote supportive parenting practices and parent advocacy (Karnes, Shwedel, & Linnemeyer, 1982). Early identification and parent training are particularly critical for gifted children from economically disadvantaged backgrounds.

Despite the need, few programs exist that are specifically designed for preschool 3- to 4-year-old children (Roedell, Jackson, & Robinson, 1980). Several factors account for the sparsity of such programs. First, lacking state and federal incentives for providing appropriate education to preschool-age gifted and talented children, few systematic procedures have been implemented for early identification and service delivery. Second, critics have questioned the reliability and validity of currently available measures for identifying giftedness in 3- and 4-year-old children. Third, parents of young gifted children frequently have little access to information about referral characteristics, available services, and need for advocacy in initiating services.

A review of current literature on gifted education, however, reveals growing recognition of the special needs of gifted and talented children in the early years (Karnes, 1983; Whitmore, 1986). Significant topics include identification procedures, characteristics, programs, and cultural issues (Sandel, McCallister, & Nash, 1993).

As indicated, one of the major obstacles to large-scale development of preschool programs for the gifted has been the concern that current measures lack reliability and validity in discriminating among children who are truly precocious, children of average ability who are early developers, and children of average ability whose high performance stems from an enriched environment. Another concern has been the efficacy of such measures in identifying gifted children who are "late bloomers." However, it has recently been argued that standardized intelligence measures truly differentiate between advanced and normal development at the preschool level (Silverman, 1986), and that giftedness should be conceptualized as significantly advanced development at the time of testing rather than as potential for adult achievement. Moreover, the imperfection of cur-

rently available measures should not preclude the delivery of services to children.

Because of concerns about reliability and validity of standardized measures when employed with young children, there is general consensus that multiple sources of data, formal and informal, should be used to identify gifted preschool-age children.

Karnes and Johnson (1986) list a number of formal instruments that have been used to assess the potential and current functioning of young gifted and talented children in intellectual, perceptual-motor, social, creative, self-concept, and musical areas. Commonly used formal measures for identifying gifted preschool-age children are the Stanford-Binet and Draw-a-Man for intelligence; the Peabody Individual Achievement Test and Woodcock-Johnson Psychoeducational Battery, Part II, for achievement; and Thinking Creatively in Action and Movement (Torrance, 1981) and the Structure of Intellect Learning Ability Tests, Primary Form (Meeker, 1984) for creativity and divergent thinking.

Informal data sources include parent and community nominations, teacher checklists, and child products (Karnes & Johnson, 1986). The Seattle Child Development Preschool Comprehensive Parent Questionnaire (Roedell, Jackson, & Robinson, 1980) provides an excellent source of data based on both parent perception and parent assessment of child performance. Pediatricians, artists, religious instructors, and other community members who are familiar with the child constitute valuable referral sources. Teacher checklists (Karnes et al., 1978a, 1978b) have been developed to assess young children's performance in a variety of talent areas. Finally, collections developed by the child as well as artistic, scientific, and other creative products provide useful assessment data.

Formal and informal data collected for each child being assessed may be reviewed by an identification/selection committee composed of professionals in gifted education, diagnostic specialists, parents, and community members. While not always possible or desirable, use of identification criteria consistent with criteria used by local school districts can facilitate children's transition to programs after preschool age.

Characteristics of young gifted children are most readily observable in comparison with other children of the same age, sex, and cultural group. Cognitively, young gifted children often display advanced vocabulary and general information, early interest in books and numbers, long attention spans, persistence and creativity in solving problems, vivid imaginations, broad or intense interests, metacognition (Moss & Strayer, 1990) unusual memory for detail, and an intense desire to know "why."

Many young gifted children also possess social-emotional characteristics such as preference for associating with older children, capacity for intense emotions, and a high level of empathy, traits that render them vulnerable to stress. Additionally, young gifted children may become frustrated

by their uneven development, e.g., when their advanced thinking but average fine-motor coordination results in products that fail to meet their goals. Kitano (1985a) found characteristics of competitiveness and perfectionism in some children attending a preschool for the gifted. These socio-emotional vulnerabilities (Roedell, 1986) may become manifested in withdrawn, shy, aggressive, or attention-getting behaviors.

Program goals for gifted children in preschool settings derive from these children's cognitive, socio-emotional, and developmental characteristics and from the rationale underlying early identification: the need to provide challenge and stimulation. Goals include (1) developing a positive attitude toward oneself and toward learning; (2) developing positive social values and interaction skills, including prosocial attitudes, independence, responsibility, task commitment, and risk taking; (3) developing and using creative and higher level thinking skills; and (4) developing competency in basic skills (language, readiness, motor) and in general knowledge.

Many of the models employed in programs for elementary-age gifted children have been successfully applied to preschool-level programs. For example, programs at the University of Illinois, Champaign-Urbana (Karnes & Bertschi, 1978; Karnes et al., 1982) have incorporated Structure-of-Intellect and open classroom models. The Hunter College (Camp, 1963) and New Mexico State University (Kitano & Kirby, 1986a, 1986b) programs involve children in unit-based curricula and independent projects. The Astor program (Ehrlich, 1980) focuses on the higher level skills of Bloom's (1956) taxonomy as well as on academic skills and creative investigation. Taylor's (1968) multiple talent approach and Renzulli's (1977) enrichment triad model have also been applied to programs for preschool-level gifted children.

Experience with gifted preschool-age children over the last several years raises a number of issues that must be considered in serving this population (Kitano, 1985b). Evaluation studies of individual preschool programs for the gifted (Karnes, Shwedel, & Lewis, 1983a, 1983b; Vantassel-Baska, Schuler, & Lipschutz, 1982) indicate that young gifted children make academic, social, and affective gains if given services designed to meet their needs. However, several questions pertinent to preschool programs for the gifted have yet to be answered: Should gifted children acquire skills at an early age just because they are able to? What are the long-term effects of early identification and early education for the gifted? Does early identification as gifted alter parent expectations for the child as well as the child's self-expectations? Does enriched preschool programming render later regular education experiences redundant?

Many gifted children enter preschool programs with academic skills and knowledge well above their chronological age expectancy levels. A major focus for these children might well be the encouragement of humanistic values and prosocial motivation. Some gifted children lose their

previously acquired status as top achievers when they enter homogeneously grouped preschools for the gifted. Further research might explore the effects of early identification and early education on self-concept. Finally, it is clear that many gifted preschool-age children acquire new knowledge and skills at a rapid rate. Without stimulation and challenge, some will find their first school experiences to be alienating. It is critical that preschools for the gifted facilitate the continuation of enrichment programs beyond the preschool level.

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GIFTED CHILDREN GIFTED AND TALENTED, UNDERACHIEVEMENT IN THE

PRESCHOOL ASSESSMENT

See SPECIFIC TEST OR ASSESSMENT

PRESCHOOL SCREENING

Preschool screening is the evaluation of large groups of children 3 to 5 years of age with brief, low-cost procedures

to identify those who may be at risk for later problems. It is based on the assumptions that early intervention should produce a significant positive effect on development, that children with developmental problems must be identified accurately as their problems are developing, and that early identification and intervention programs should be implemented without prohibitively high costs (Holland & Merrell, 1998; Lichtenstein & Ireton, 1984). While also used frequently in the field of medicine, screening in special education and related fields refers to the early identification of risk factors associated with later school achievement and social adjustment. Because of the complexity of outcomes from many early childhood health problems such as otitis media (Mandell & Johnson, 1984), screening approaches that draw from several disciplines are considered the most comprehensive (Elder & Magrab, 1980).

Historically, several movements and philosophies from various disciplines have been associated with preschool screening and have defined its methods and purposes. These movements include the early enrichment and compensatory education programs (e.g., Head Start), the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program designed to focus on medically oriented services for children with developmental disabilities or neurological impairment, and the Education for All Handicapped Children Act (PL 94-142), and its successor legislation, the Individuals with Disabilities Education Act (IDEA) which includes “child find” provisions and mandates a broad range of special educational and related services for children with disabilities in schools.

Preschool screening can be seen as a continuum of opportunities available at any time in a child’s early development. Within this larger conceptual context, procedures can be initiated before the child’s birth, with the identification of mothers who possess characteristics linked with developmental or learning problems (e.g., genetic defects, maternal illness, high maternal age, exposure to drugs, toxins, and radiation, poor maternal health or nutrition during pregnancy). Factors occurring at birth or shortly thereafter can also impact a child’s later development. These include anoxia, birth injury, low birth weight, and physical or sensory defects. Because some infants with known risk factors show no early signs of disability, have mild impairments, or exhibit developmental delay falling within the boundaries of normal functioning, the establishment of registries for periodic rescreening has been suggested as a strategy for identifying and monitoring the progress of these hard-to-detect children (Lloyd, 1976).

Screening activities constitute the first stage of a longer assessment process. Other stages include readiness, diagnosis, instructional-related assessment, evaluation of the results of instruction, and program evaluation (Boehm & Sandberg, 1982). Screening is sometimes confused with readiness, which focuses on a child’s preparedness to benefit from a specific academic program (Meisels, 1980). All stages

of the assessment process comprise a sequence proceeding from general to specific, culminating with individualized programming and ongoing monitoring of the child's progress within the intervention program (Bagnato & Neisworth, 1981). As the first stage of this process, screening does not comprise diagnostic procedures leading to recommendations about instructional programming. Rather, it involves general decision making that differentiates children in need of further assessment. This must be done with the knowledge that most screening instruments do not meet the requirements of the IDEA for educational placement. When done with proper understanding of its major purpose and the limitations of screening instruments, screening can enhance a school's or district's ability to identify and serve preschoolers with disabilities. If used to substitute for comprehensive individual examinations, it can lead to major errors in identification and educational programming (Reynolds & Clark, 1983).

Screening can be conceptualized as a process consisting of two components (Lichtenstein & Ireton, 1984). The first component, outreach, involves initial contact with parents, professionals, preschool centers, and community agencies to inform them about the services offered and to arrange for children to participate in the screening program. Other terms used to refer to this initial location of children are "child find" (Harbin, Danaher, & Derrick, 1994; Meisels, 1980), from the provisions of the IDEA (20 U.S.C. § 1412), and "case finding" (Barnes, 1982; Harrington, 1984). The major goals are to locate a target population and to maximize attendance at the actual screenings. To these ends, it has been recommended (Zehrback, 1975) that outreach procedures emphasize the growth-related needs of all children instead of developmental impairments. Thus strong case finding and publicity efforts are essential so that services will be rendered to all families rather than only to those families who have the sophistication to find out about them. (Crocker & Cushna, 1976).

An approach designed to maximize correct identification within the target population is mass screening. This refers to a program that has the goal of screening every child in the target population—a goal emphasized by the most recent iteration of the IDEA, passed in 2004, which expressly adds homeless children with disabilities to a state's obligation to identify and locate all children with disabilities (20 U.S.C. § 1412[a][3]). Such a program serves an entire preschool population; hence, there is little stigma associated with parents' positive response to the offer of screening services. Selective screening, a variation of mass screening, provides services to particular demographic subgroups or geographic areas that have a large number of unidentified children with special needs.

The second component of the screening process consists of the assessment of those children found eligible, the synthesis of information, and the determination of need for further assessment. Generally, the structure of this component is

based on: (1) the kinds of questions that need to be answered; (2) the types and severity of handicapping conditions to be assessed; (3) the ages of the children; and (4) the psychometric properties of available instruments (Harrington, 1984; Scott & Hogan, 1982). Specifically, screening activities should answer whether the child is delayed enough in one or more domains (cognitive, sensory, motor, social/emotional, speech, language) to be considered at risk and in need of further diagnosis. If so, the screening should provide direction regarding what types of diagnostic assessments are needed to confirm or refute the screening impressions (Horowitz, 1982). The handicapping conditions should have a prevalence rate high enough to justify screening large numbers of children but not so high that every child must receive a diagnostic evaluation. Also, instruments should be chosen that have been normed on the ages of children represented in the target population and that have good reliability and validity. The precision of screening instruments is not as crucial as that of diagnostic instruments because of the general nature of the decisions made from them. It should be realized that individual administration maximizes the validity of test results with preschool-age children (Reynolds & Clark, 1983).

With respect to the psychometric properties of screening instruments, reliability and validity are often reported in correlational terms. These correlations provide only an approximation of a measure's accuracy in assigning individuals for further assessment (Lichtenstein, 1981). Thus a more strongly recommended method of determining a screening instrument's psychometric adequacy is in terms of classificational outcomes. In this way, validity is measured by comparing the screening decision (whether to refer a child for further evaluation) with the child's actual status as determined by a criterion measure. This is called the *hit rate* method (Lichtenstein & Ireton, 1984); it provides a direct indication of the suitability of decisions from screening. The validity of an entire screening system rests on correct understanding of the problem to be identified (the base rate), the rate of referrals for further assessment (the referral rate), and the hit rate (the percentage of children identified as needing services).

Generally, screening outcomes can be organized into screening positives (children regarded as high risk and referred for further assessment) and screening negatives (children regarded as low risk and not referred). For each child screened, four results are possible, based on the accuracy of the screening decision and the child's actual performance on criterion measures during a diagnostic evaluation. A child may be found to be in need of special services and referred by the screening procedures, or a child may be found to not need additional help. Given the possibility of error in screening decisions, however, a child may be referred by the screening procedure but not need special services (a false positive or overreferral error), or not referred but be in need of services (a false negative or underreferral error). To evaluate the

consequences of using a given screening system, then, it must be determined whether children are referred at the rate intended, whether the right children are referred, and whether alternative procedures might accomplish the task more successfully. Other relevant issues are the appropriateness of the criterion measures used, the possibility of bias in the screening process (Reynolds & Clark, 1983), and strategies for maximizing parent involvement.

Given the long-held recognition that parents are vitally important in meeting the educational needs of their children, they should be involved in every phase of screening (Lichtenstein & Ireton, 1984). Not only is parent involvement mandated by IDEA, but parents also constitute a rich source of information about specific aspects of their child's development that may be unavailable elsewhere. Parents can also make sure that the assessment of their child is culturally competent. The screening of environmental influences from home and classroom settings is a rapidly growing area of research and clinical attention (Adelman, 1982).

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HEAD START PRESCHOOL ASSESSMENT PRESCHOOL SPECIAL EDUCATION

PRESCHOOL SPECIAL EDUCATION

Preschool special education is the delivery of therapeutic and educational services to handicapped infants and children from birth to age 6. These services are designed to provide optimum learning experiences during the crucial early childhood developmental period for children with a wide variety of handicapping conditions. The importance of the preschool years to future success has been documented by many child development authorities, who emphasize that the first 5 or 6 years of a child's life are the periods of highest potential growth in physical, perceptual, linguistic,

cognitive, and affective areas (Lerner, Mardell-Czudnowski, & Goldenberg, 1981). These early periods of development are particularly important to the handicapped child, since the earlier that these children are identified and education begun, the greater the chances of lessening the impact of the handicapping condition on the child and society. A recent report by the House Select Committee on Children, Youth, and Families (1985) stated that for every dollar invested in preschool special education programs, there is a \$3 reduction in special education cost later.

In 1968 Congress recognized the need for services and models of effective preschool special education programs, and the Handicapped Children's Early Education Assistance Programs (HCEEP; PL 90-583) was enacted. This act, sometimes known as the First Chance program, provided monies for the development and implementation of experimental projects for young handicapped children and their families. These projects developed effective programs for children, but they also were required to include parents in the activities, operate in-service training, evaluate the progress of both the children and the programs, coordinate their activities with the public schools and other agencies, and disseminate information on the projects (DeWeerd, 1977). Legislative support continues with IDEA Part H and Part B.

The Head Start movement, which began in 1964 as part of the War on Poverty and was funded by the Office of Economic Opportunity, was another reason for the growth of preschool special education programs. The goal of the Head Start program was to offer preschool children from economically deprived homes a comprehensive program to compensate for their deprivation. These programs involved medical care, nutrition, parent involvement, socialization, and educational intervention.

A further influence on preschool special education was the passage and implementation of PL 94-142, the Education for All Handicapped Children Act of 1975, which mandated services for all handicapped children from 3 to 5 years of age unless such a mandate conflicted with state law. This legislation provided the following two sources of funds for handicapped preschool children: state entitlement money, which depends on the number of handicapped children counted by the state in its child-find activities; and incentive grants, available to states with approved state plans that offer services for 3- to 5-year-old handicapped children (Lerner et al., 1981). Current issues of service provision under IDEA focus on eligibility continuity for children moving from early intervention programs under Part H to preschool special education programs under Part B of IDEA (Harbin, Danaher, & Derrick, 1994).

One of the important areas in preschool special education is the early identification of children with handicapping conditions. Attempts are being made to locate children who will need additional or special assistance in order to succeed in school because of physical, social, intellectual, emotional, or communications problems. The federal child-find program,

which mandates states to actively seek out handicapped children, is one way to locate children who can benefit from early intervention services. Identifying children who should receive special services is a complex task because of the wide variety of needs and characteristics of the children (Lerner et al., 1981). Children with severe handicapping conditions are often identified at birth or shortly thereafter; however, many children with milder or less obvious handicaps are not so easily identified. Tjossem (1976) has presented three categories of high-risk infants. First, there are those at established risk; they have diagnosed medical disorders that are known to result in developmental delays. The early medical, social, and educational interventions used with these children are designed to help them function at the higher end of potential for those with their disorders. Second, children at biological risk have a history that suggests biological insults to their developing central nervous system. While early diagnosis is often inconclusive for these children, close monitoring and modified care are important during the developmental years. Third, children at environmental risk are those who are biologically sound, but who have early life experiences, that, without intervention, have high probability for resulting in delayed development. These early experiences could include problems with maternal and family care, health care, and opportunities for expression and stimulation. These three categories are not mutually exclusive, and when they interact, they increase the probability of abnormal development.

Being identified and placed into preschool intervention programs is a difficult process for many handicapped young children. However, for early intervention to be effective, provisions must be made for early identification and rapid entrance into community preschool special education programs (Tjossem, 1976). This identification process begins with both medical and educational screening to locate children at high risk for developmental and learning problems. Three comprehensive screening tests used in this process are the Denver Developmental Screening Test, Developmental Indicators for the Assessment of Learning, and the Developmental Screening Inventory. Once these children have been identified, the next step, a comprehensive diagnostic assessment, can be done to pinpoint a child's particular skills and deficits. The purpose of this assessment should be to prepare appropriate intervention programs. It is critical to match the assessment techniques to the needs of the individual child (Hayden & Edgar, 1977). Two criterion referenced tests that can be used for diagnosis and program planning for many children with handicaps, in many curriculum areas, are the Brigance Diagnostic Inventory of Early Development and the Learning Accomplishment Profile Diagnostic Assessment Kit. Detailed descriptions of screening instruments and diagnostic tests can be found in Lerner et al. (1981), Fallen and McGovern (1978), Safford (1978), and Salvia and Ysseldyke (1985). This assessment of handicapped

children requires the expertise of many professionals and needs to be a team effort.

Identifying, screening, and assessing handicapped preschool children are meaningless tasks unless appropriate services are then provided to them (Hobbs, 1975). Once the child has been identified and diagnostic information is complete, then an appropriate program plan and curriculum must be developed. There are many different program delivery models that can be used, as well as a wide variety of philosophical bases for the programs.

Preschool special education programs have evolved from many varied theoretical positions, ranging from a child development model to precision teaching and systematic instruction. These approaches may be used with different populations, or in different environments, but they have all been shown to be beneficial. The child development model is mainly an enrichment model that provides multiple activity centers such as often found in many regular preschool programs. This is the model that many Head Start programs follow, and it is most successful with children with mild handicapping conditions. The sensory-cognitive model is based on the work of Maria Montessori. It emphasizes materials designed for the child's developmental level; these materials are presented in a carefully constructed environment. Other programs are based on the verbal-cognitive model, which draws heavily from the developmental theory of Piaget and stresses structured teacher-child interactions. A more formal approach was proposed by Bereiter and Englemann in their verbal-didactic model; this approach attempts to raise each child to the essential level for success in first grade by frequent repetition of teacher-child responses accompanied by the principles of reinforcement (Ackerman & Moore, 1976). Severely handicapped children often benefit from highly structured systematic instruction programs that rely on detailed task analysis and behavioral theory.

Other factors to be considered include the type of handicapping condition, the age of the child, and the geographical area to be served. Some programs are noncategorical and serve children from a wide variety of handicapping conditions; the Portage Project and the Rutland Center are examples. Other programs specialize in serving children from limited categories or even subcategories of handicapping conditions. One of the best known programs of this type is the Seattle Model Preschool Center for children with Down's syndrome.

The age of the child often affects where the educational services are delivered; since it is difficult to transport infants for long distances, many of the programs for younger children are home-based, with the teacher traveling to the students. As the child becomes older, programs may be center-based, with the child attending a school program or a combination of home and school program. Another factor that affects where programs are delivered is the geographic region. Sparsely populated rural regions may not have suf-

ficient numbers of children within a reasonable distance of a school; therefore, they may rely on more home-based services than might be found in large urban areas. Examples of home-based projects are the Portage project, the Marshalltown project, and Project SKI*HI; the Precise Early Education of Children with Handicaps (PEECH) project, the Chapel Hill project, and the Magnolia Preschool are all combined home- and center-based programs. Center-based programs include the Rutland Center, the Seattle Model Preschool Center, and the UNISTAPS project. These programs were all originally supported by HCEEP funding and are representative of many programs across the United States (Karnes & Zehrbach, 1977).

The actual curriculum content in preschool special education programs varies depending on the needs of the children; however, in most cases, the programs are based on one or more of the following approaches. Some preschool special education curricula are organized around an amelioration of deficits approach, which builds the curriculum based on an assessment of a child's problems; the content areas are directed toward correcting identified deficits. Other programs use a basic skills area approach. In this, curricula are organized around skills or processes such as attention, language, sensory motor processes, social skills, perception, auditory processes, gross and fine motor skills, self-help skills, and memory. The developmental tasks approach uses sequences of normal development to derive the curricula. The content areas in this approach are broad categories of child development that are task analyzed and sequenced. Finally, the educational content approach begins with areas of academic content; it defines areas of learning on the basis of preacademic or academic content. The most often included areas are prereading, numbers, music, art, dance, play, storytelling, social studies, and nature. In many cases these various approaches are combined to develop appropriate educational programs (Wood & Hurley, 1977).

A crucial component to any preschool special education program is parent involvement. As stated by Shearer & Shearer (1977), there are several reasons to involve parents in their child's education. The parents are the consumers and often want to participate in the education of their children. When parents are taught how to teach their children, they can help transfer what is being learned in school to the home environment. These teaching skills can also be used in new situations, and with the handicapped child's siblings, making the parents better teachers of all their children. Research has shown that significant gains made by children are often lost when the school programs end. A key factor in preventing this is the effective involvement of parents. In addition, if parents are knowledgeable about their child's program, they can be advocates for the services that the child needs; this skill can be used all through the child's life.

Recent research studies have demonstrated the effectiveness of preschool special education programs for handi-

capped young children. Karnes et al. (1981) presented a review of many studies that examined the efficacy of preschool special education. While there are some methodological questions about early studies by Skeels and Dye, the research, in general, has shown that early stimulation and preschool attendance make a significant difference in the rate of growth of children, and that these gains are maintained over time. It has been shown that diverse curriculum models can be equally effective in promoting school success if high standards of quality are maintained (Schweinhart & Weikart, 1981). In addition, inclusive programming for these children is being heavily supported (Cavallaro, Ballard-Rosa, & Lynch, 1998; Holland, Guitierrez, Morgan, Brennan, & Zercher, 1997).

A longitudinal study of the Perry Preschool Program (Schweinhart & Weikart, 1981) has provided a strong argument for preschool special education programs. This study followed 123 children from age three through the school years. It found that those children who attended preschool had consistently higher school achievement, higher motivation, fewer placements in special education programs, and less delinquent behavior. An economic benefit-cost effectiveness analysis of the Perry Preschool Program was conducted; it found that there was a 248 percent return on the original investment when savings from lowered costs for education, benefits from increases in projected earnings, and value of mothers' time released when the child attended preschool were considered.

There are many reports of successful preschool special education programs. While many of these programs differ greatly in the populations they serve, their theoretical bases, and their curriculum content, their effectiveness has been demonstrated. It is essential that these benefits be recognized, and that programs for all handicapped preschool children be supported.

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PRESCHOOL ASSESSMENT PRESCHOOL SCREENING

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PRESIDENT'S COMMITTEE FOR PEOPLE WITH INTELLECTUAL DISABILITIES

President's Committee for People with Intellectual Disabilities changed its name from President's Committee on Mental Retardation in July 2003, through an executive order signed by President George W. Bush. As stated on the PCPID website (2006), PCPID is a federal advisory committee, established by presidential executive order to advise the President of the United States and the Secretary of the Department of Health and Human Services on issues concerning citizens with intellectual disabilities, coordinate activities between different federal agencies, and assess the impact of their policies upon the lives of citizens with intellectual disabilities and their families. PCPID was initially organized as a blue-ribbon panel by President John F. Kennedy in 1961 and formally established as a committee by President Lyndon B. Johnson in 1966 under an executive order. Eight years later, in 1974, new goals for the committee, focusing on deinstitutionalization, prevention, and legal rights were established by President Nixon. In 1996, a new set of goals for the committee encouraging full community inclusion and citizens' rights were created by President William J. Clinton.

The committee produces an annual report to the President which is the product of members of the committee resulting from a variety of committee conferences. All committee activities include input from self-advocates (consumers), family members, professionals, researchers, service providers, state agency leaders, and direct support professionals. The members of the President's Committee for People with Intellectual Disabilities have taken the New Freedom Initiative introduced by President George W. Bush in February 2001 and built their work around the same basic categories: expanding educational opportunities, increasing access to technology, improving individual and family support, increasing employment and economic independence, and promoting access and integration into community life. PCPID offices are located at Aerospace Center, Suite 701, 370 L'Enfant Promenade, SW Washington DC 20447.

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MENTAL RETARDATION

PREVENTION, PRIMARY

This term refers to efforts made to reduce the incidence or prevalence of handicapping conditions through the establishment of medical and social programs that attempt to change those conditions responsible for their development. During the past 30 years, several approaches have been emphasized that have resulted in significant progress in the prevention of handicapping conditions.

A number of programs have been developed to provide neonatal care for those children delivered at risk. Some of these programs have been effective in reducing various postnatal factors that result in retardation. For example, infant stimulation programs have been established in hospitals to facilitate the development of low-birth-weight or high-risk infants (Brown & Hepler, 1976). These programs use such measures as involving mothers in infant stimulation techniques, making infants in incubators more attractive to staff who interact with them by placing ribbons on them, and providing intensive follow-up services to both mothers and infants. These programs have been brief and the results somewhat time-limited, but they have resulted in increased attention to opportunities for preventive intervention models.

It is widely recognized that a small proportion of children are mentally retarded because of organic causes; the majority are retarded because of environmental and cultural deficiencies, poverty, and inadequate child-rearing approaches (Grossman, 1983). Massive social changes that address these causes must occur to achieve comprehensive prevention of mental retardation and other handicapping conditions.

The President's Committee on Mental Retardation set a goal of preventing the occurrence of 50 percent of all cases of mental retardation by the year 2000 (President's Committee on Mental Retardation, 1976). As a result, research has been done on virtually all known causes of mental retardation. Patton, Payne, and Beirne-Smith (1986) indicate that for each cause, a specific preventive measure has been found. The most fruitful approaches to prevention include carrier detection, prenatal monitoring, and newborn screening. Combinations of these approaches appear to be more successful in preventing various handicapping conditions than the use of individual techniques (Sells & Bennett, 1977). Prevention is often approached within the framework of determining cause. The major causes appear to result from

infections and intoxications, trauma or physical agents, disorders of metabolism and nutrition, gross brain disease, unknown prenatal influence, and chromosomal abnormalities (Grossman, 1983).

Preventive measures implemented during the preconception period can significantly reduce hereditary, innate, congenital, and other constitutional disorders. Adequate prenatal care and analysis for possible genetic disorders are two general approaches to prevention usually associated with the gestational period. Yet one out of every four women who gives birth in a hospital has never received prenatal care from a physician during her pregnancy (Koch & Koch, 1976). Anticipating potential problems that may occur at delivery can avert problems during the perinatal period. For example, anoxia (lack of oxygen to the brain that may cause mental retardation and other learning problems) is a condition that can be prevented (Kirk & Gallagher, 1979).

Environmental intervention, adequate nutrition, and avoidance of hazards constitute the bulk of preventive measures during the childhood period. For example, a high correlation between ingestion of lead in drinking water and mental retardation has been reported (Gearheart, 1980; Needleman, 1994).

Blood-screening techniques can be used to identify some conditions (e.g., Tay-Sachs disease) transmitted through autosomal recessive genes or x-linked genes. Using several screening procedures, Thoene et al. (1981) identified seven metabolic disorders caused by an enzyme deficiency. Because of the low incidence rate of most conditions, carriers are so rare that general screening procedures would have to involve massive numbers of people to be effective (Westling, 1986). Thus genetic screening is most often used by those who have already had one child with a disorder or who are aware that the condition exists in their family.

Monitoring the fetus prior to birth has resulted in the identification of over 100 inherited disorders (Sells & Bennett, 1977). Amniocentesis (drawing some of the amniotic fluid surrounding the fetus for cellular examination) is used to detect three types of problems: those identified through the chromosomal structure, those identified through enzyme deficiencies, and neural tube defects. Milunsky (1976) indicated that women who are over 35, couples in which one parent is a balanced carrier of translocation, and couples who have already had one Down's syndrome child are the three groups that most frequently seek chromosomal analysis through amniocentesis. The use of fetoscopy permits the physician to insert a small tube through the mother's abdominal wall to examine parts of the fetus. This permits the determination of physical characteristics that may be useful in determining whether a disorder exists. Sonography consists of the use of ultrasound waves to outline the fetus and identify structures indicative of handicapping conditions (e.g., spina bifida, microcephaly) through different densities. Rh incompatibility may be prevented

through Rh gamma globulin injections for the Rh-negative mother after the birth of her first Rh-positive child or after a miscarriage.

Newborn screening tests permit the identification of many infants with inborn errors of metabolism (e.g., galactosemia, phenylketonuria). In some cases, mental retardation may be prevented by altering the diet (Carpenter, 1975). Hypothyroidism can also be detected through birth screening using the same blood samples used with phenylketonuria (Dussault et al., 1975). Since some diagnostic indicators develop slowly during the first 6 months, the newborn screening should be followed with additional testing during later infant examinations.

Avoidance of certain substances (e.g., drugs, alcohol, X-rays) is the only current source of prevention for some disorders. Avoidance behavior can sometimes be the only method of prevention, as in the case of HIV/AIDS (Kelly, Murphy, Sikkema, & Kalichman, 1993). Preconceptual vaccinations can fight some bacterial infections (e.g., rubella, syphilis). Yet it has been estimated that 25 percent of children, older girls, and young women in the United States are not protected against rubella (Gearheart, 1980). A Caesarean-section birth may be used with women who have a herpes virus at the time of delivery. Postnatal causes that can often be prevented include direct trauma to the head, cerebral hemorrhage, lesions on the brain, infections that cause conditions such as encephalitis and meningitis, and electric shock. Although controversy still surrounds the role that chronic malnutrition plays in mental development, there is evidence that it can result in a greater risk of infection and increased likelihood of disease from other agents (Westling, 1986).

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GENETIC COUNSELING INBORN ERRORS OF METABOLISM PHENYLKETONURIA PREMATURITY

PREVOCATIONAL SKILLS

Secondary handicapped students may have difficulty in learning vocational concepts because they have not mastered prerequisite basic skills that serve as the foundation for many vocational activities. Three areas closely related to vocational skills are reading skills such as vocabulary, comprehension, and the use of a glossary; mathematic skills such as time, measurement, and application of algorithms; communication skills, including listening, speaking, and writing.

Essential to learning vocational skills is a set of hands-on exploratory experiences that will help each individual to answer self-awareness questions and develop work values. Examples of hands-on experiences include setting up a printing press, practicing laboratory safety, and following directions. These prevocational hands-on activities help students to identify materials, tools, and processes, discover physical properties of materials, measure sizes and quantities, compute costs, and develop social skills (Phelps & Lutz, 1977).

A student's success in a vocational program is influenced by his or her readiness to participate. Readiness skills are

often identified as prevocational knowledge and attitudes. Brolin and Kokaska (1979) identified three curriculum areas with 22 major competencies. The areas and skills are (1) daily living (i.e., managing family finances, caring for personal needs, and engaging in civic activities); (2) personal-social abilities (i.e., interpersonal relationships, problem solving, independence); (3) occupational guidance and preparation (i.e., knowing and exploring occupational possibilities, work habits, and behaviors; being able to seek, secure, and maintain satisfactory employment).

Several factors can be considered predictors of vocational development for handicapped individuals. These include achievement of basic academic skills, adaptive behavior, verbal manners and communication skills, performance on vocational checklists, and actual samples of work behavior (Forness, 1982). A closer look at these predictors indicates that assessing a handicapped individual's vocational potential by evaluating his or her academic and social skills within the context of a work-related situation is valuable. Skills learned in a classroom setting may not generalize when applied to work settings. One step toward achieving generalization of academic skills is to develop a technique to assess applied academic and social skills. Neff (1966) suggested four approaches to the evaluation of the work potential of handicapped individuals. They are the mental testing approach, the job analysis approach, the work sample approach, and the situational assessment approach.

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VOCATIONAL EVALUATION VOCATIONAL REHABILITATION COUNSELING VOCATIONAL EDUCATION

PRIMARY IMMUNODEFICIENCY DISORDERS

This classification of health-related disorders encompasses over fifty distinct, genetically determined illnesses and does not include HIV, AIDS, or secondary causes such as chemo-

therapy. The incidence of these disorders range from 1 in 500 to 1 in 1,000,000, with approximately 25,000 patients identified in the United States at the time of this submission. As the title suggests, these disorders affect the immune system, and though most are congenital (patients are born with them), symptoms may not become apparent until adulthood.

Perhaps the most famous case of primary immunodeficiency disorders involved David, "the bubble boy" in Houston, Texas. His particular type of disorder involved several different parts of his immune system, causing severe susceptibility to infections from all viruses and bacteria. David lived 12 courageous years inside a sterile environment. Though the immune system disorders were first recognized in the mid 1950s, David's ordeal advanced our understanding of immune deficiencies, autoimmune disorders, cancer, and infection process in general.

As with David, children and adults with primary immunodeficiency disorders are susceptible to infectious diseases. Some experience chronic, recurrent, unusual, invasive, or severe infections, and have multiple concurrent conditions before the immune system is evaluated. Some of these disorders are treatable by replacing the portions of the immune system that is missing. An example would be intravenous gamma globulin (IVIG; a product containing antibodies from pooled human plasma donations) for patients with X-linked agammaglobulinemia or Common Variable Immunodeficiency. Patients with one particular disorder were the first to undergo "gene therapy," in which affected cells were removed and DNA containing the normal genes was inserted. When these cells were reintroduced to the patient, the symptoms of their disorder were relieved, allowing a decrease in reliance on costly, complicated medical therapies. Similar to David's story, these patients have contributed to a very promising new field of study that may help most genetically determined illnesses (i.e., cystic fibrosis, sickle cell anemia, and so on).

Due to the chronic nature of these disorders and their sequelae, many of those affected alter their lifestyle to preserve their health. Most patients and family members quickly become experts in their particular disease and must be accepted as such in order to create the most "normal" lifestyle possible. The most common obstacles to overcome are those associated with absences from work or school. Absences may frequently occur due to illnesses or the need for doctor visits and therapy. Anticipation of this need allows for unique, innovative solutions. Homebound programs and dual enrollment options provide the flexibility needed to adapt to this unusual situation. As always, open communication between school officials, families, physicians, and students is required. Often, the school setting provides the opportunity for affected children to become more responsible for their own health care. Public education, though it results in increased infection exposure, is usually well tolerated by patients whose immune systems are being

reconstituted. Outbreak of any infectious diseases (such as measles, chicken pox, hepatitis A, or influenza) should result in immediate notification of patients so that physicians can decide on the appropriate course of action.

Other special needs may be required on an individual basis, not as a direct result of the immune disorders but due to the sequelae of repeated infections. Some examples include special diets, frequent meals or special restroom privileges due to intestinal malabsorption, hall passes or scheduled nursing visits for medication administration, or assignment of classes to minimize absences.

Physicians, patients, and families should be flexible to work within the school system when possible, scheduling routine care around important times and dates; however, they must also rely on the patience, compassion, and understanding of others in their lives to reach the goals set by the patients themselves. Further information and support can be obtained from the Immune Deficiency Foundation at 25 West Chesapeake Avenue, Suite 206, Towson, MD, 21204.

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**AIDS DYSMORPHIC SYNDROME
CHRONIC ILLNESS IN CHILDREN
NATIONAL ORGANIZATION FOR RARE DISORDERS
OFFICE OF RARE DISEASES, NATIONAL INSTITUTES OF
HEALTH
OTHER HEALTH IMPAIRED**

PRIMARY MENTAL ABILITIES TEST

The Primary Mental Abilities Test (PMA; Thurstone & Thurstone, 1965) is a group-administered measure of both general intelligence and specific intellectual factors that the authors call primary mental abilities. In earlier versions of the PMA, six to eight primary mental abilities were identified. Subsequently, this number was reduced to the current five factors. There are six levels of the test (K-1, 2-4, 4-6, 6-9, 9-12, and adult). The adult test is identical to that for grades 9-12. No attempt was made to prepare adult norms, and no additional psychometric characteristics at the adult level are included in the documentation.

A description of the behaviors sampled by the five subtests of the PMA is provided by Salvia and Ysseldyke (1978). Verbal meaning assesses one's ability to derive meaning from words. Number facility assesses one's ability to work with numbers, to handle simple quantitative problems

rapidly and accurately, and to understand and recognize quantitative differences. Reasoning requires a person to solve problems logically. Perceptual speed assesses quick and accurate recognition of similarities and differences in pictured objects or symbols. Spatial relationships assesses ability to visualize how parts of objects or figures fit together, what their relationships are, and what they look like when rotated in space. The presence of and emphasis given to each of the specific intellectual factors within the various levels reflect the judgment of the authors as to their relative importance within each grade level. Only one level (grades 4–6) includes all five factors; perceptual speed is omitted from levels 6–9 and 9–12 and reasoning is omitted from K–1 and 2–4.

The test has several technical limitations. Standardization of the scale was based only on geographic, age, and grade stratification; reliabilities of the subtests are not included for K–1 and are relatively low for the other levels (Salvia & Ysseldyke, 1978). The test-retest reliability estimates for total scores range between .83 and .95 and may be deemed satisfactory, while the reliability estimates for the levels vary considerably from one grade to another and frequently are too low to be used with confidence (Quereshi, 1972). As expected, the total score is superior to any of the subtest factor scores in predicting grades in separate school subject areas (Milholland, 1965). The PMA was developed using techniques to demonstrate that there are several factors involved in intelligence and learning. Yet, the total score is superior to single factors in predicting achievement in any one subject area. This contradicts the theoretical underpinnings of the test itself.

Historically, the PMA occupied a prominent position in the development of cognitive tests. The original series, published between 1938 and 1941, was based on extensive factor analytic work and represented a major contribution to test construction. The high aspirations held for the PMA battery reflected in early reviews were never realized (Schutz, 1972). While the Thurstones continued to contribute to both multifactor science and technology after the PMA was commercially available, very little of this new knowledge and technology found its way back into subsequent PMA revisions. Thus the PMA soon became outstripped by competing tests in terms of technical quality and functional utility. Because of the technical superiority of other instruments assessing similar abilities, reviewers have questioned the continued use of the PMA (Quereshi, 1972; Schutz, 1972).

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PRIVATE SCHOOLS AND SPECIAL EDUCATION

Prior to the passage of the Education for All Handicapped Children Act of 1975 (PL 94-142), private schools that existed to provide services to disabled children were mainly tuition-based, profit-making institutions that held the parents responsible for costs. With the passage of PL 94-142, it became the local education agency's responsibility to provide a free, appropriate, public education to all children regardless of severity of disability.

Until 1977, handicapped children, especially those with severe handicapping conditions, had fewer, consistent options for receiving educational services. Although many school districts had developed programs, especially for the less severely disabled, there were still areas of the United States where children remained at home without an education, were institutionalized without an education, or received private education at the parents' expense (Bajan & Susser, 1982).

After 1977, local education agencies began to quickly develop or expand their own programs to meet this new responsibility. There still remained those few students for whom appropriate services could not be provided, either because of the severity of their disability or because of a lack of appropriate numbers of a specific handicapping condition within the local education agency. These are the students who were typically enrolled in private schools as of 1985. Public Law 94-142 and subsequent amendments also mandated that it was the local education agency's (LEA) responsibility to provide the tuition for those students that the LEA placed in private schools (McQuain, 1982). Although it is clear that the LEA must be responsible for paying the tuition for students who are in private placement as a result of LEA placement, it is unclear as to the responsibility for payment for those students who are in church-related or other private schools at the request of the parent or a social agency (Wylie, 1981). For example, if a child's handicapping condition necessitates placement in a residential school to provide education, the placement, including nonmedical care and room and board, becomes the responsibility of the LEA. If placement is for noneducational concerns, home

or community problems, then the LEA is responsible only for the educational costs. It sometimes becomes extremely difficult to separate education from other needs (McQuain, 1982).

Some decisions have been made by the courts related to placement issues. A program must be state approved to receive tuition payments from the LEA (Grumet & Inkpen, 1982). If an appropriate program exists within the LEA for a child, the LEA will not be responsible for private tuition (McQuain, 1982). Parents are not entitled to reimbursement for tuition as a result of voluntary placement in nonapproved schools (Grumet & Inkpen, 1982), unless a clear case can be made that the program was appropriate and the LEA failed to take timely and appropriate action in evaluation or placement. The decision as to whether a child should attend a private school should involve the availability of an appropriate program in the LEA, the proximity of the program to home, the severity of the handicapping condition, and the provision of related services (Guarino, 1982). The LEA must ensure that all children in private placement receive the same rights and procedures that they would receive if in public placement (Grumet & Inkpen, 1982). Therefore, the LEA, in conjunction with the state education agency, has the responsibility to monitor the programs in the private sector.

Within the continuum of services concept, a private placement is seen as most restrictive because of the inability to mainstream. Therefore, being placed in a residential setting, a child must first receive the full benefit of opportunities provided within the LEA (Grumet & Inkpen, 1982).

A recent Supreme Court decision has lifted restrictions on on-site instruction, and the 1997 IDEA amendments helped to clarify an LEA's obligation to provide services to parochial school students (Osborne, DiMattia, & Russo, 1998).

Audette (1982) described additional areas in which concerns must be addressed in the future. These include transportation, coordination of individual education plans, artificiality of environment of private placement, rising costs of placement, unanticipated placements, and due process issues. The questions about whether parochial school students with disabilities must have the same level of service as their peers, and on-site services remain and need to be satisfied (Osborne et al., 1998).

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INDIVIDUALS WITH DISABILITIES EDUCATION IMPROVEMENT ACT OF 2004 (IDEIA) MAGNET SCHOOLS MAINSTREAMING

PRIVILEGED COMMUNICATION

Privileged communication is a legal concept which protects the communications within certain professional relationships from disclosure in a court of law without the client's consent. Privileged relationships have historically included the attorney-client and spousal privileges, which are based in common law traditions, and clergy-communicant and physician-patient relationships, which have been established by statute in all fifty states and U.S. territories. All fifty states have also enacted privileged communication laws covering licensed psychiatrists and psychologists and their patients. Only a few states, however, have included other counselors and psychotherapists, licensed or unlicensed, under their privilege statutes.

Privileged communication laws are an exception to most rules of evidence for court proceedings, which generally work to promote the discovery of any relevant information. Privilege exists in response to society's acknowledgement that the effectiveness of certain relationships depends upon allowing clients to speak freely within the professional relationship, with the assurance that what is said within that relationship will remain private and will not later be used against the person's interests. All groups that have received privileged status have done so because they made the successful argument that their ability to help their clients would be seriously impaired or even destroyed if they were forced to reveal confidential information against the client's wishes.

Legal privilege must be distinguished from confidentiality; though they are related in the sense that both address conditions in which professional communications may or may not be disclosed, they originate from different sources and provide different levels of protection from unwanted disclosure. Confidentiality is a professional duty to refrain from disclosing client information gained during the course of the professional interaction with a client, and is based upon

the ethical standards and rules of the various professions. In addition, confidentiality requirements have been incorporated into legislation and the licensure laws of every state, prohibiting certain professionals from revealing client information without client consent, and specifying the conditions under which confidentiality may or must be broken (Knapp & Vandecreek, 1996). Confidentiality is not, however, protected when the professional is required to testify in court.

In contrast, privilege "is an exception to the general rule that the public has a right to relevant evidence in a court proceeding . . ." (Smith-Bell & Winslade, 1994, p. 184), and is based in privileged communication laws enacted by state legislatures and Congress. Thus, privilege is strictly a legal principle, applies only in legal situations, and is the only legally permissible basis for a professional's refusal to disclose client information in a legal court. The distinction between confidentiality and privilege is, most simply, that confidentiality *restricts* what the professional can reveal without the client's consent, whereas privilege *relieves* the professional from revealing client information in court.

However, there are a number of statutory limitations to both confidential and privileged communications. The most common exceptions to privilege require the professional to disclose privileged information when (a) there is reason to believe the client may be a danger to him or herself or others (b) child abuse is suspected, (c) the client puts his or her own mental state at issue, and (d) various other conditions are present, as specified by individual state statutes, such as elder abuse, sexual abuse by a psychotherapist, in malpractice suits against one's therapist, among others.

A recent Supreme Court case has established new and important precedent regarding the psychotherapist-patient privilege. In the case of *Jaffe v. Redmond* (1996), the Court held "the confidential communications between a licensed psychotherapist and the psychotherapist's patient in the course of diagnosis or treatment are protected from compelled disclosure under Rule 501 of the Federal Rules of Evidence" (p. 338). This finding addressed two major problems in the privileged communication arena: it effectively established a federal psychotherapist-patient privilege for the first time, and it extended the privilege to licensed "psychotherapists," thus acknowledging the many professionals, other than physicians and psychologists, who provide mental health services that warrant privileged status. Although the Court's finding is binding only in federal courts, it delivers clear guidance to state courts and legislatures through its message about the importance the nation's highest Court gives to therapeutic relationships.

Privileged communication laws are not, however, applicable to most educational settings, including special education contexts. Educators have not been included in the groups whose communications with clients have been afforded privileged status, with the possible exception of doctoral-level, licensed school psychologists. The *Jaffe v. Redmond* case discussed above did extend privilege to a master's

level therapist, but did not address whether privilege would apply to any educational setting. It is possible that school counselors, if they are licensed, could make a case for the need for privileged communication in certain circumstances, but this has not happened to date. Thus, communications with school counselors and other education professionals must be disclosed in court when required.

In summary, privileged communication is a legal concept that protects the communications between certain groups of professionals and their clients from disclosure in court. Most education professionals are not currently covered under these statutes, however, and thus their communications with students and parents are not protected from disclosure in legal proceedings. Legal views of privilege are continuing to evolve on both state and federal levels, and new statutes and interpretations are most likely to appear in the future.

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CONFIDENTIALITY OF INFORMATION

PROBLEM SOLVING, CREATIVE

See CREATIVE PROBLEM SOLVING.

PROCEDURAL SAFEGUARDS

See DUE PROCESS.

PROCESS ASSESSMENT OF THE LEARNER-TEST BATTERY FOR READING AND WRITING

The Process Assessment of the Learner-Test Battery for Reading and Writing (PAL-RW; Berninger, 2001), uses a variety of tasks to assess children's development of reading and writing processes. According to the author, the PAL-RW can be used to screen by identifying students at risk for reading or writing problems, monitor by tracking student progress in early intervention and prevention programs, and

diagnose by evaluating the nature of reading, or writing-related processing problems.

The PAL-RW includes the following subtests (with examples given):

Alphabet Writing (speed of writing lowercase letters of the alphabet from memory in 15 seconds)

Receptive Coding

Task A: student is shown a word (AT) for 1 second, then shown IT. Are the words the same?

Task B: student is shown a word (BAT) for 1 second, then shown C. Is the letter in the word?

Task C: student is shown a word (ATE) for 1 second, then shown ET. Are the two letters in the word in the correct order?

Task D: student is shown a word (MOTHER) for 1 second, then shown L. Is the letter in the word?

Task E: student is shown a word (SOCIETY) for 1 second, then shown EI. Are the two letters in the word in the correct order?

Expressive Coding

Task A: student is shown a word (QAST) for 1 second, and then must write the word.

Task B: student is shown a word (LADFUST) for 1 second, and then must write the third letter.

Task C: student is shown a word (POGDUS) for 1 second, and then must write the last three letters.

Rapid Automatic Naming (RAN)

Rapid Letter Naming: student names letters as fast as he or she can. (Item 1: m t g k b h r a n; Item 2: f i p s e r o u.)

Rapid Word Naming: student names words as fast as he or she can. (dog eat of sit over.)

Rapid Digit Naming: student names numbers as fast as he or she can. (Item 1: 3 7 8 1 9 6 2; Item 2: 67 89 45 73.)

Rapid Word and Digit Naming: student names Words and Digits as fast as he or she can. (tea eat 56 of 89 over.)

Note-Taking Task A: Listen to a story and take notes as it is read.

Rhyming

Task A: Listen to three words and tell which one does not have the same sound. (ball call help.)

Task B: (The word is PIG. Tell me all the real words you can that rhyme with PIG.)

Syllables: Hear a word (both real and made-up), say the word, and now say it with a sound left out. (PUTTING. Say PUTTING. Now say it without the PUT.)

Phonemes: Hear a word (both real and made up), say the word, then say it with a sound left out, and then say what sound was left out. (SIT. Say SIT. Now say IT. What sound is missing?)

Rimes: Say a word (real or made up) with a sound left out. (Say BIKE without /b/.)

Word Choice: Student is shown three words, indicate the one which is spelled correctly. (PIG PAG PIZE.)

Pseudoword Decoding: Read some words that are not real words. (DRIY HAFTE STROC.)

Story Retell: After being read a short story, student answers questions and then retells story in his or her own words.

Finger Sense

Repetition (1 and 2): Touch thumb to index finger 20 times (right and left hands); scored for completion time).

Succession (1 and 2): Touch thumb to each finger five complete times (right and left hands); scored for completion time).

Localization: After having one finger touched out of sight, tell which finger was touched.

Recognition: Each finger is assigned a number. After having one finger touched out of sight, tell what number of the finger was touched.

Fingertip Writing: After having a letter "written" onto a fingertip, tell which letter was written.

Sentence Sense: Read three sentences and tell which one makes sense.

I ATE THE CAKE.

I EIGHT THE CAKE.

I ATE THE CAPE.

Copying: Here is a sentence (or paragraph). Copy it as fast as you can.

Task A: THE LAZY BOY JUMPED OVER A BALL.

Task B: paragraph

Note-Taking Task B: Take the notes created earlier (Note-Taking Task A) and write a paragraph based on the notes.

The PAL-RW was normed in 1999–2000 on 868 individuals in grades K–6 from around the United States and was stratified for sex, race/ethnicity, parental education, and geographic region. Normative sampling is adequate (>100 at each grade, ranging from 105 in grade 6 to 142 in grade 1). All scores are based upon the grade of the child tested, not the chronological age.

Test-retest comparisons based on 86 children in grades 1, 3, and 5 tested a second time 14 to 49 days later show reliabilities that ranged from .61 to .92. Five measures had reliabilities below .70. Of the 14 tests, seven had lower scores on retest.

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PROCESS TRAINING

See ABILITY TRAINING.

PRODUCTION DEFICIENCY

Production deficiency is closely tied to mediation theory (Flavell, 1970). Mediation refers to the intervention of some process between the initial stimulating event and the final response (Reese & Lipsitt, 1970). Special education students are often unable to “mediate” or use other task-appropriate strategies as intermediate steps in the learning process (Torgersen, 1977). Such inability may be due to special education students being inactive learners lacking goal-directed motivation (Torgerson, 1977), or the learning environment not stimulating mediational interventions with the learner (Kozulin, & Falik, 1995).

Additional research in this area has resulted in an alternative explanation to those previously mentioned; special education students’ poor academic performance may reflect a production deficiency (Naron, 1978; Wong, 1980). A production deficiency suggests that a student may have the ability to use the mediation strategy or another strategy but fails to spontaneously and appropriately produce it (Wong, 1980). For these children, prompting and training in metacognition and related processes might prove helpful.

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MEDIATIONAL DEFICIENCY

PRO-ED, INCORPORATED

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PROFESSIONAL COMPETENCIES FOR WORKING WITH CULTURALLY AND LINGUISTICALLY DIVERSE STUDENTS

Students in public schools today look, sound, learn, and live in ways that differ from past populations. Of the 45 million students enrolled in public and private elementary and secondary schools, over 30 percent are from groups designated as racial/ethnic minorities (Gonzalez, Brusca-Vega & Yawkey, 1997). In addition, many students are at risk for school failure because they live in poverty, live in a single-parent family, or have a poorly educated mother (Pallas, Natriello, & McDill, 1989). Therefore, culture, as used in this article, refers to differences in race and ethnicity as well as socioeconomic status, beliefs, values, modes of expression, ways of thinking, and ways of resolving problems. The competencies listed below represent minimal competencies that teachers working with culturally and linguistically diverse students with exceptionalities (CLDE) should have.

Culture

All educators working with CLDE students should (1) understand culture in relation to child-rearing practices, socialization systems, and differences in attitudes toward education and motivation; (2) understand cross-cultural patterns, practices, and attitudes and their effect on learning and behavior; (3) understand diversity in behavior and

learning styles; and (4) understand the historical origins of local communities (Baca & Almanza, 1991).

Language

As there is considerable research to suggest that inclusion of minority students' language and culture into the school program is a significant predictor of academic success, all educators working with CLDE students should (1) understand the basic concepts regarding the nature of language; (2) understand the theories of first and second language acquisition; (3) identify and understand regional, social, and developmental varieties in language use; and (4) encourage parents to provide appropriate language models for their children, whether that be English or another language (Baca & Almanza, 1991). Educators should be able to use functional language and purposeful conversational interactions (Tharp, 1994). If educators are not fluent in the student's native language, they will need to work in collaboration with their bilingual and ESL colleagues.

Consultation and Collaboration

The basic collaboration abilities needed by educators working with CLDE students have been identified by Harris (1991, 1996). The first is "to understand one's own perspective." Educators should be able to understand their own cultures and their relationship to other cultures. Educators also need to understand their own beliefs and expectations, especially regarding the abilities of students from various cultures.

The second collaborative ability is "the effective use of interpersonal, communication, and problem-solving skills." Educators must be caring, respectful, empathetic, congruent, and open in collaborative interactions. They must be able to communicate clearly and effectively in oral and written form. For effective cross-cultural communication, educators must be aware of cultural differences in communication and relationships and, when necessary, use interpreters appropriately. Educators should be familiar with the kinds of information that can be easily interpreted and conduct pre- and post-sessions with interpreters so that the language and intent of communications are clearly expressed. Educators must be able to grasp and validate overt as well as covert meanings and affects in communication. They also must be able to interview effectively to elicit information, explore problems, and set goals and objectives for the collaboration (Harris, 1991, 1996).

The third ability is "to understand the roles of collaborators." In a multicultural society, educators should be able to facilitate problem-solving sessions with individuals with different values and problem-solving styles and collaborate with culturally diverse personnel (Harris, 1996). Therefore,

educators working with CLDE students need to be familiar with familial and institutional objectives relevant to CLDE students, and understand the resources that can be provided by other personnel such as bilingual educators, ESL educators, parents, and paraprofessionals (Harris, 1991).

Working with Families and Communities

According to Baca and Almanza (1991), educators who work with CLDE students should be able to plan and provide for the direct participation of parents and families of CLDE students in the instructional program and related activities. They should also know local community resources for CLDE students.

Assessment

Alternative assessment models have been present over the last two decades in response to inconsistencies found with students from culturally and linguistically diverse backgrounds (Mercer & Rueda, 1991). Therefore, it is of critical importance for educators to be able to use a wide variety of alternative assessments with CLDE students. Because language assessment is key to documenting the difference between language difference and language disability, educators working with CLDE students should know existing assessment procedures and instruments in language proficiency, language dominance, and language development, as well as cognitive/intellectual development, social-emotional behavior, adaptive behavior, and achievement. They should also be able to adapt evaluation procedures to compensate for potential cultural and linguistic biases of the assessment process (Baca & Almanza, 1991).

Curriculum

Educators working with CLDE students should know and understand the philosophies and content of general education, bilingual education, special education, bilingual special education, multicultural education, and ESL (Baca & Almanza, 1991), because these programs may represent the least restrictive environment for CLDE students.

Instructional Planning

Educators working with CLDE students should be able to use data from language and achievement assessment to plan instructional programs and determine appropriate instructional goals and objectives. They should be able to monitor the effectiveness of instructional programs and modify them when needed to meet the unique needs of CLDE students (Baca & Almanza, 1991). Educators also need to plan for the instructional roles of other adults, e.g., paraprofessionals, bilingual educators, and ESL educators.

Instruction

All educators should be able to adapt instruction, use ESL strategies, and use appropriate behavior management strategies. Educators should have, as a primary objective, the establishment of a classroom climate that fosters successful experiences for *all* students (Baca & Almanza, 1991).

Materials

Educators working with CLDE students should know sources for materials appropriate for students from various cultural and linguistic backgrounds and should be able to evaluate materials in terms of their quality, availability, and appropriateness. The materials educators use should stimulate active, meaningful, and purposeful involvement of students (Baca & Almanza, 1991).

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PROFESSIONAL SCHOOL PSYCHOLOGY

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PROFESSIONAL STANDARDS FOR SPECIAL EDUCATORS

Professional standards for special educators are rules and guidelines governing the conduct of persons who work in special education. The development of competency standards is an attempt to increase the overall quality of service in the field and to strive for excellence in the profession. In 1966 the Council for Exceptional Children developed Professional Standards for Personnel in the Education of Exceptional Children. In 1979 the council approved Guidelines for Personnel in the Education of Exceptional Children. These standards did not include formal definable criteria for determining whether a teacher had acquired the necessary competencies. The most recent set of standards published by the council (*Exceptional Children*, 1983) consists of three policy statements focusing on common requirements for the practice of special education: Code of Ethics, Professional Practice, and Standards for the Preparation of Special Education Personnel. These statements describe the philosophical position of special education professionals, the skills the specialists should exhibit in their jobs, and how training organizations should best prepare future special educators.

The development of competency standards for special educators is important for a variety of reasons. One is to increase the consistency and quality of service across

the special education field. Another is to require excellence so that it may translate into greater academic and social achievements for the students with disabilities being served. Standards also serve as a way to measure the quality of performance of special educators. They help protect the profession from embracing techniques or skills that are based more on subjectivity than on empirical data. Heller (1983) suggested that if professionals in special education do not oversee themselves, someone else will.

Standards of professional competence for special educators describe expectations in two general categories of duties: those that are necessary for successful and ethical treatment of persons labeled with special needs, and those that are necessary for the growth and stature of the field of special education. The specific details can be found in *Exceptional Children* (1983). Professionals have several obligations, including the use of their training to help those with special needs. Their methods must be appropriate and effective. Special educators must also use techniques to manage behavior that are ethical, humane, and consistent with existing rules and regulations. Aversive techniques may not be used except as a last resort. Professionals also serve the parents of exceptional children by communicating clearly and by soliciting and using their advice and information. Parents should be informed of all matters related to their particular situations and of the rights afforded them by law. Special educators should serve as advocates for the exceptional person in a variety of ways—changing government policy, monitoring adequacy of available resources, and protecting the individual rights of the special needs person. Special educators also have the responsibility of keeping abreast of new developments and findings in special education.

Professional standards exist to guide the conduct of special education professionals. One way to ensure that special educators are influenced by these standards is for all institutions that prepare special education teachers and professionals to provide for their students the most current standards and to incorporate those standards into the educational process (Standards for the Preparation of Special Education Personnel, 1983). At the state and national levels, any licensing or accreditation requirements in existence could be compared with the profession's standards and adjusted accordingly.

Once the development and implementation of the standards are completed, professionals in the field need to concentrate their efforts in three areas. First, the development of continuing or in-service education must address the competencies needed by professionals already in the field (Stedman, Smith, & Baucom, 1981). Second, as mentioned by Gersten (1985), efforts should focus on which teacher competencies actually make a difference to people with special needs (Englert, 1983). Interviewing experts to develop professional competencies (Zane, Sulzer-Azaroff, Handen,

& Fox, 1982) is useful in developing a large number of skills and standards that seem logical, but such a strategy is insufficient in that it does not provide for a determination of whether such skills are functionally related to student improvement. Third, updating and changing of the standards must continue (Standards for the Preparation of Special Education Personnel, 1983). The validation process is one way that new skills and competencies will become known and incorporated into the standards as the nature of the field changes and the needs of the developmentally disabled shift over time. By validating them, updating as needed, and incorporating them into institutions that train special educators, the standards will become an integral part of the training of special educators and will achieve the original purpose for their development—producing qualified professionals and providing maximum improvement of persons with special needs.

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ETHICS TEACHER EFFECTIVENESS

PROFILE VARIABILITY

Profile variability is an index of test scatter (individual variation in test scores between or within various psychological and educational tests) first defined by Plake, Reynolds, and Gutkin (1981). It is used as a diagnostic aid in determining the degree of intratest variability in an individual's performance on the subtests of any multiscale assessment

device. A large degree of within test scatter has long been held to be an indicator of the presence of a learning disability (Chalfant & Scheffelin, 1969).

Test scatter has typically been determined by range (the highest minus the lowest score for an individual on a common family of tests), or by the number of test scores deviating at a statistically significant level from the individual's mean score on all tests administered (the latter sometimes is referred to as the number of deviant signs, or NDS). Profile variability is similar in some respects to range, but it is more accurate, more stable, and more powerful than older indexes of scatter. Profile variability encompasses data from all tests or subtests administered to an individual. It is not limited to the two most extreme scores as is the range.

Calculation of the index of profile variability is straightforward because it is the variance of a set of scores for one person on more than one measure, hence, the name profile variability. Profile variability for each member of a group or population can be estimated to be (Plake et al., 1981):

$$S^2 = \sum_{j=1}^k \frac{(x_{ij} - \bar{x}_j)^2}{k-1}$$

where S^2 = the index of profile variability

x_{ij} = the score of person i on test or subtest j

$\bar{x}_j$ = the mean score for person i on all tests (k) administered

k = the number of tests administered

The resulting value can then be compared with data taken from the standardization sample of a test or some other group to determine whether the variance of the individual's profile is an unusual or a common occurrence. In a research setting, it may also be of interest to know if the mean S^2 for one group differs at a statistically significant level from the mean S^2 for another group. A statistical test of the significance of the difference has been developed and is detailed in Plake et al. (1981).

Relatively little research on the clinical utility of S^2 has been completed as yet. However, of the various scatter indexes, profile variability is the most stable and the most mathematically sound.

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PROFOUNDLY RETARDED

See MENTAL RETARDATION.

PROGRAM EVALUATION

Program evaluation in elementary school and secondary school education has been an area of considerable activity during the past 20 years. Program evaluation has been such an active area largely because of public concern about program accountability as well as a desire by school professionals to provide quality programs, and outcomes services, (Cronbach, 1982). Although no universal definition exists, program evaluation can be characterized by two essential activities: systematic, purposeful data collection relative to one or more important evaluation questions; and the use of evaluation information to judge whether a program is worthwhile (Rossi, Freeman, & Wright, 1985).

Numerous educational program evaluations have been conducted in school settings, with many of the evaluations focused on federally funded programs and projects such as Head Start, Follow-Through, and Chapter I programs. Essentially, these program evaluations have been summative in nature, whereby large numbers of students who received the program were compared with large groups of students with similar characteristics who did not receive the program or who received another program. The primary intent of these evaluations has been to determine program effectiveness and to decide whether the outcome justifies disseminating the program to other sites and students as part of public policy initiatives.

Large-scale educational program evaluation has been proven beneficial to federal and state policy makers in terms of aggregate data for decision-making purposes. Additionally, issues and methods have been clarified in important ways for those interested in evaluation design and measurement. Despite these gains in understanding, what does not seem to have been readily established is the direct and practical relevance of program evaluation to local level programs, especially small-size school districts. More specifically, local school professionals have voiced concern over how they can use program evaluation to help them develop and improve local offerings (Dunst, 1979; Kennedy, 1982).

In special education, program evaluation has become an area of avid interest and increasing activity at local school district levels nationwide, with collaborative efforts being undertaken among administrators, staff, and outside consultants. An important impetus to this avid interest and increasing activity at the local level was a two-day national conference on special education program evaluation held in St. Louis during December 1983 (Council of Administrators of Special Education, 1984). At that conference, which

was jointly sponsored by the Council of Administrators of Special Education and the Office of Special Education and Rehabilitation Services, four proven models of local-level special education program evaluation were presented by their proponents. The invited audience of over 100 special education directors and supervisors from throughout the nation took part in workshops to learn about these practical approaches. Subsequent to the conference, local school district applicants were reviewed and the various models were field tested during 1984 at about 20 local sites (Associate Consultants, 1985).

Case study results of these field tests, along with empirical results from additional evaluations of local special education programs that occurred during 1985 and 1986 through state department initiatives, coupled with professional publications on special education program evaluation, have all coalesced to delineate and propose several important features and characteristics of this rapidly developing area. These features and characteristics are reflected in terms of the process of special education program evaluation, the foci of evaluation efforts, the methods, procedures, and instruments for conducting evaluations of special programs, and the enhancement of the use of evaluation information for program planning.

The process of special education program evaluation is best considered in the generic sense, i.e., as the systematic gathering of data about a program or service to answer one or more clearly articulated evaluation questions. For special education programs, the following evaluation questions usually have been raised by local level practitioners when planning an evaluation: (1) What were the characteristics of the students who were provided the program? (2) How was the program actually implemented? (3) Were program goals attained? (4) How did various individuals—teachers, parents, students—react to the program and its outcomes? (5) Was the program responsible for the outcome results? (6) Was the program worth the investment? Although it is not possible for all of these questions to be addressed in a particular evaluation, the questions are important in that the evaluation information gathered in response to them can lead to particular program planning actions.

The foci of special education program evaluation can be numerous, since a special education services delivery system includes a range of programs and services (Maher & Bennett, 1984). For instance, various instructional programs serving special needs learners can be the foci of evaluation efforts including programs such as resources rooms, self-contained classrooms, supplemental instructional programs, regular class mainstreaming programs and, of course, individualized education programs (IEPs). In the area of related services, a district's student counseling program, for example, can be the object of an evaluation as can other programs such as parent education programs or physical therapy services. Similarly, a special education program evaluation can focus on a staff development course

or on an important, yet often neglected type of program, e.g., an assessment program such as preplacement evaluation. In deciding the evaluation questions to be addressed in relation to special education programs and services, a local-level team or committee approach has been found to be useful in selecting the most appropriate questions and in facilitating the involvement of staff in the evaluation endeavor (Maher & Illback, 1984).

Since diverse evaluation questions can be addressed in relation to various special programs and services, it is not surprising that a plan for special education program evaluation lists many kinds of methods, procedures, and instruments. At the local level, special education program evaluation plans seem to reflect not comparative group evaluation designs, as has been typical in regular education special evaluation, but special education evaluation plans characterized by a single case approach, where the program (e.g., resource room) is compared with itself over time (e.g., over a 2- to 3-year period) to determine whether it is effective (Tawney & Gast, 1984). Usually, evaluations include use of instruments and procedures that rely on teacher or staff retrospective judgment, especially through use of behavioral checklists and rating scales and parent and teacher interviews. Additionally, criterion-referenced testing and review of IEP goal attainment data have been commonly employed to answer important evaluation questions. Hence, both qualitative and quantitative data gathering approaches appear to be necessary to the conduct of practical and meaningful special education program evaluation.

An emphasis on the use of special education program evaluation information seems to have been a positive outgrowth of practitioners' desires to act on the information for program planning purposes. In this regard, it has been found important that written evaluation reports be kept brief, that they be written in the nontechnical language of the school audience for which it is intended, and that the narrative be augmented with clearly developed tables, graphs, figures, and other illustrations to emphasize important points. Most important, recommendations for program planning should be specific as to how to take the next steps and clear as to how the steps were derived. To facilitate use of the information, it has been found useful to hold group meetings or forums between evaluation personnel and target audiences.

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PROGRAMMED INSTRUCTION

Programmed instruction is a unique educational method based on principles emphasized by B. F. Skinner (1954, 1958). First, the use of positive reinforcement is preferable to punishment or lack of feedback. Second, positive reinforcement is more effective in producing behavioral changes if given frequently and immediately after each response. Last, there is value in presenting students with small chunks of information to learn that will eventually result in desired behaviors. Skinner sought to apply these principles through programmed learning and the use of teaching machines.

The development of an automated teaching machine by Pressley in the 1920s anticipated Skinner's work. Pressley's machine required students to read questions and then press buttons to answer (in multiple-choice format). The machine presented the next question in a sequence only after the student made the correct choice. Pressley's concept and technology were not readily accepted or widely used. Skinner (1958) attributed the limited use of Pressley's teaching machine to "cultural inertia" and the incomplete or inappropriate application of learning principles. Skinner developed another teaching machine that not only provided frequent and immediate feedback, but also presented the information to be learned in small, easily acquired segments that the student had to master before moving on to new material.

The small steps increased the chances of a student's making a correct response, provided positive reinforcement and student motivation, and ensured student success at each step as well as at the final goal.

Programmed learning has been hailed as allowing truly individualized instruction permitting students to progress at their own pace. In many cases, it seems to be highly motivating to the student because of the immediacy of results, high density of reinforcement, and enjoyment from manipulating the machine (when a teaching machine is used). It has also been instrumental in showing how to teach complex tasks by breaking them down into small, teachable segments. In addition, when using teaching machines, teachers are freer to use their time in more productive ways than presenting information to students.

While the early application of programmed instruction used machines to present learning programs, programmed texts and workbooks soon followed. The increasing use of computers in special education has been revitalizing interest in variations of programmed instruction. An impressive characteristic of modern computers is the great degree of individualized instruction now possible for each student because of the development of branching programs (Rubin & Weisgerber, 1985; Schackenberg & Sullivan, 1997). Students diagnosed as learning disabled and mentally retarded (mild to profound) have learned a variety of skills on computers, such as addition, subtraction, word recognition, matching to sample (Richmond, 1983).

However, it is the application of learning principles and not the use of a computer that is the important issue. A computer does not automatically incorporate programmed instruction principles; in fact, much of the educational software in use today is to a large extent based on the traditional trial-and-error procedures that may result in academic failure in many children (LeBlanc, Hoko, Aangeenbrug, & Etzel, 1985). Integrating instructional principles of programmed learning into the development of educational methodologies, whether in software, textbooks, or other forms, is a way to maximize the chances for learning in special education students.

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COMPUTER MANAGED INSTRUCTION COMPUTER USE WITH STUDENTS WITH DISABILITIES DIRECT INSTRUCTION OPERANT CONDITIONING

PROJECTIVE TECHNIQUES

See PERSONALITY ASSESSMENT.

PROJECT ON CLASSIFICATION OF EXCEPTIONAL CHILDREN

In the early 1970s, Nicholas Hobbs was asked to direct a systematic review of the classification and labeling practices for exceptional children. Sponsored by 10 federal agencies and organized by Elliot Richardson, then secretary of health, education, and welfare, this review had several objectives.

The first objective was to increase public understanding of the issues associated with labeling and classifying handicapped individuals. The second objective was to formulate a statement of rationale for public policy, including suggestions for regulatory guidelines. The third objective was to educate professionals who were ultimately responsible for the provision of services to the population of exceptional children (Hobbs, 1975a).

The results of this review, known as the Project on Classification of Exceptional Children, were reported in the publication *The Futures of Children* (Hobbs, 1975b). Included in this report was a list of recommendations that detail actions to be taken as well as who should be responsible for the implementation, the cost of service, and the length of time required to accomplish the project objectives.

Hobbs, a distinguished psychologist and educator, was generally opposed to the practice of labeling individuals. His major argument against labeling was that it is very limited in value. Hobbs pointed out that while the original intent of classification was to provide equal access and opportunity for the handicapped population, the process usually resulted in the transfer of the label or classification to a negative condition or description of the child. For example, a child

who was classified within the category of mental retardation became known as a mental retardate.

Hobbs (1975b), citing the current practices of the time, warned:

categories and labels are powerful instruments for social regulation and control, and they are often employed for obscure, covert, or hurtful purposes: to degrade people, to deny them access to opportunity, to exclude “undesirables” whose presence in some way offends disturbs familiar custom, or demands extraordinary effort. (p. 11)

One of the seven major recommendations to emerge from the project was the call to improve the classification system. Specifically, the project report suggested five ways to improve the existing process. The suggestions included (1) revision of the classification process; (2) constraints in the use of psychological testing; (3) improvements in early identification procedures; (4) safeguards in the handling of confidential records; and (5) provision of due process in identification and placement.

One finding of the project was that the current classification systems were inadequate. Citing arbitrary and outmoded conceptual guidelines, the members called for a comprehensive classification system that would be based on the needs of exceptional children. According to the general recommendations, the classification system should reflect the full range of conditions of children who need special services. Under this model, classification would emphasize the services required rather than the types of children served.

The specific recommendations of the project members included the formation of a national advisory committee for the purpose of establishing a comprehensive classification system. As a result of such a system, there would be increased understanding of the complexities of the characteristics and etiology of handicapping conditions. The changes proposed in the classification system were not regarded as an end product but rather as a vehicle for improving service and programming for handicapped individuals and their families.

Historically, there has been a great deal of controversy associated with the classification systems for handicapped populations. Since the introduction of the first special education textbook in the early 1920s, there has been a demand for more accurate classification systems Kaufman & Halahan, 1981).

Currently, there is little evidence in relevant literature that the recommendations resulting from the Project on Classification of Exceptional Children have been implemented on a national level. Individual agencies have made progress in several areas identified by the project report (e.g., improvement of diagnostic procedures, increases in services for the families of handicapped individuals, reclassification of mental retardation based on structural

support needed [Gresham, MacMillan, & Siperstein, 1995] and protection of individual's right to due process). However, the major recommendation calling for a national advisory panel that would help to establish policy and direct relevant research has yet to be realized.

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AAMR CLASSIFICATION SYSTEM LABELING

PROJECT RE-ED

The project on the Re-Education of Emotionally Disturbed Children (Project Re-ED) evolved after a 1953 study of mental health needs by the Southern Regional Education Board. The study indicated that there was great need for child mental health programs with demonstrated effectiveness, reasonable cost, access to a large talent pool of trained personnel, and potential for transfer of techniques to public schools. In 1956 the federal government sponsored a study of mental health programs in France and Scotland, where mental health services were provided by French *educateurs* and Scottish “educational psychologists” to children with desperate needs because of the effects of evacuation and other traumas resulting from World War II. The National Institute for Mental Health (NIMH) study group recommended a pilot project using trained personnel in the United States (Hobbs, 1983).

In 1961 a NIMH grant of \$2 million was awarded to George Peabody College for Teachers (now part of Vanderbilt University) and the states of Tennessee and North Carolina. Nicholas Hobbs was the primary developer of the 8-year pilot project for moderately to severely disturbed children (ages 6 to 12) in residential centers in Nashville, Tennessee, and Durham, North Carolina. Centers were in residential areas and provided services to groups of 24 and 40, subdivided into groups of eight. Program planning emphasis was on health rather than illness, teaching rather

than therapy, the present rather than the past, and the operation of a total social system of which the child is a part rather than intrapsychic processes alone. Initial planning was pragmatic rather than theoretical; the theory developed with project research and experience. Hobbs (1978) later commented that one of the important ideas in the planning and development of Project Re-ED was that there should be no orthodoxy or dogma, but a “colleagueship” of discovery guiding the activities of professional individuals working together closely.

Basic ideas underlying program development included (1) insight is a possible consequence but not a cause of behavioral change; (2) health and happiness must grow out of life as it is lived, not as talked about in the context of personality theory; and (3) emotional disturbance in children is not something within the child, but a symptom of a malfunctioning ecosystem. Teacher-counselors and liaison teachers were carefully selected and provided with condensed, highly functional training (master's level) and a dependable system of day-to-day consultation by highly trained and skilled professional personnel. Teachers were not expected to solve complex problems intuitively, but were trained in understanding psychodynamics of individual development and families. Training also included child development, remedial instruction, management of behavior, recreational skills, and use of consultants.

Hobbs believed that trust between children and adults is basic to reeducation and that training of the children should be designed to encourage development of self-confidence by ensuring success. Symptoms were treated directly (controlled) without emphasis on causality. Family and school contacts were maintained while children were in residence. By 1970 the age range was expanded to include adolescents and preschool children.

Follow-up studies of Project Re-ED children (Weinstein, 1974) indicated that although the reeducation program did not change the students into “normal” children, they were better adjusted than disturbed children who were not in the project. Since the average length of stay in centers was about 7 months (contrasted to several years in some other types of residential centers), it appears that the project met its goal, which was not to cure children, but to restore to effective operation the small social system of which the child is an integral part. Hobbs thought that Project Re-ED would be most likely to pay off when its concepts were applied in public schools. By 1983 about two dozen reeducation centers were established in nine states and several others were being planned. Professional consensus now is the Project Re-ED is a viable means of providing effective services to disturbed children.

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LIFE SPACE INTERVIEWING RESIDENTIAL FACILITIES

PROJECT SUCCESS

Project Success (PS) is an academic and social remediation program for the college-bound specific language-handicapped or dyslexic student. The intent of the program is for the language-handicapped student to become language-independent as well as socially and psychologically adjusted to the new environment.

Becoming language-independent means that the dyslexic individual learns how to read and spell any word by relying on his or her own integrated knowledge of the phonemic structure of the American-English language. Students in PS acquire this knowledge initially by memorizing how the 50 phonemes and 26 letters can be employed to identify 271 sound symbol assignments for reading and 245 sound symbols assignments for spelling.

This total number of assignments for both reading and spelling are taught using a multisensory approach. The instructional methodology used is Nash's (1984) adaptation of the original Orton Gillingham, Tri-Modal, Simultaneous Multi-Sensory Instructional Procedure (OG, TM, SMSIP). This procedure trains the learner to use the senses simultaneously to memorize and to integrate up to 84 percent of all American-English words. In addition to reading and spelling remediation, the program remediates math and writing deficits. There is also a social habilitation program.

The written expression program concentrates on teaching the writing of sentences as outlined by Langan (1983). The social habilitation/remediation component of PS was developed to give students an opportunity to give back to fellow students what they have received in a therapeutic, personal, and productive way. As students go through the PS social component, they learn about the secondary characteristics associated with dyslexia. In addition, students have the opportunity to enhance their sense of self-awareness and to be more sensitive to the psychosocial implications of being dyslexic.

The project's arithmetic remediation component assumes that the carrying out of math functions is an exercise in decoding. Thus students who are deficient in math skills are taught to analyze a math problem into a sequence of sentences; each sentence is representative of a particular step or procedure associated with the solving of a particular math problem.

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READING DISORDERS

PROJECT TALENT

Project Talent was conceived in the late 1950s as an ambitious survey of American youth. A two-day battery of specially designed tests and inventories was administered to a 5 percent sample of high-school students from across the United States. The intention was to follow-up those tested at regular intervals, and through this process develop an information base about the processes by which men and women develop and use their abilities. The goals of Project Talent were to develop a national inventory of human resources; to achieve a better understanding of how young people choose and develop their careers; and to identify the educational and life experiences that are most important in preparing individuals for their life work (Flanagan et al., 1962).

The group tested included over 400,000 students, constituting a 5 percent probability sample of all students in grades 9, 10, 11, and 12 in public and nonpublic secondary schools in the United States in the spring of 1960. In addition, several supplemental samples were tested in 1960 to address special questions. These included a probability sample of all 15 year olds, whether or not they happened to be in the grade 9 to 12 range or, for that matter, in school. Also included were all high-school students in Knox County (Knoxville), Tennessee. Finally, over 10,000 students from 100 schools originally tested as ninth graders in 1960 were retested for two days as twelfth graders in 1963.

The Project Talent battery included a wide variety of aptitude and achievement tests, sample information in academic and nonacademic areas, and a questionnaire on vocational

interests. There was also a personality inventory and a biographical questionnaire containing nearly 400 questions about school life, out-of-school activities, general health, plans, aspirations, home, and family. In addition, each of the more than 1000 participating junior and senior high schools provided information on its instructional and guidance programs, facilities, staffing, and student/community characteristics.

The original plan for Project Talent called for follow-up of those tested 1, 5, 10, and 20 years following the expected graduation of each class. There were subsequent modifications with follow-up surveys 1, 5, and 11 years following the year of class graduation. For example, the original twelfth-, eleventh-, tenth-, and ninth-grade students were surveyed in 1961 through 1963, respectively, when students in each sample were at the model age of 19 years. Surveys were by mail, with a random sample of nonrespondents intensively pursued (by questionnaire or, if necessary, interview) to allow the development of accurate population statistics.

Each of the follow-up surveys sought information on postsecondary education, career choices, work experiences, and family plans, and were timed to occur at key points in individuals' personal and career development. The first- and fifth-year follow-ups focused on the years in which the participants began to put their career choices into action, either through education, training, or direct job experience. Most individuals had completed their formal education had entered the labor force, and had started their families at the time of the 11-year follow-up. The most recent survey focused on each individual's satisfaction with educational preparation, careers, and general quality of life.

Another more limited line of research involved the follow-back design. This approach was based on the fact that approximately 5 percent of those entering medical school in the mid 1960s, for example, were part of the Project Talent sample. It is possible to check names of those enrolling in medical school against the Project Talent files, and as a result have valuable precollege data on a random sample of those entering medical school.

The results of Project Talent are far more extensive than can be covered in this report. The body of knowledge includes technical reports and published articles by the Project Talent staff between 1962 and the present, as well as articles by researchers accessing the information through the Project Talent Data Bank. Many of these reports are in university libraries; others can be obtained through Publications Service, American Institutes for Research, P.O. Box 1113, Palo Alto, California 94302.

The initial report of results from the Project Talent staff was in 1964; it described the inventory of talent in the United States (Flanagan et al., 1964). One highlight from the one-year, follow-up surveys was the tremendous amount of change in career plans. For example, those tested in 1960 were asked to indicate career plans. One year after high school graduation, more than half of those electing each of

the career alternatives as high school seniors had changed their plans (Flanagan et al., 1966). Percentages were even lower for those graduating in 1961 to 1963. Of interest was the fact that changes were toward career choices more in line with abilities and interests.

Results of the fifth- (Flanagan et al., 1971) and the eleventh-year (Wilson & Wise, 1975; Wise, McLaughlin, & Gilmartin, 1977) follow-up studies have also been reported. An important finding from the eleventh-year follow-up was that nearly 25 percent of the men and women at age 29 still planned to obtain further education toward various degrees (Wise et al., 1977).

The data collected in conjunction with Project Talent are available to scientists, stripped of identifying information and on a cost-recovery basis. The most comprehensive study done by an outside investigator using this data was that published by Christopher Jencks and his colleagues in the book *Inequality: A Reassessment of the Effect of Family and Schooling in America* (1972).

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PROSOPAGNOSIA

Prosopagnosia is a rare acquired defect in facial recognition that is a consequence of focal brain damage. Visual acuity remains intact. Individuals that develop prosopagnosia are unable to recognize faces as familiar and so do not know

whose specific face they are seeing. This is true despite adequate ability to recognize the generic face. For example, a young patient who developed prosopagnosia was puzzled as to why all the actors on a favorite television program had been changed. The faces no longer looked familiar to her, nor could she recognize particular characters by sight. Similarly, she was unable to recognize pictures of members of her own family. This deficit in visual recognition of familiar faces occurs independently of any defect in language or cognition.

Prosopagnosia is often accompanied by other specific kinds of visual disturbances. Individuals with prosopagnosia usually have either a unilateral or bilateral visual field defect. That is, they are unable to see one portion of what ordinarily can be seen when the eyes are held fixed at mid position. This defect is secondary to brain damage or damage to the optic nerve radiations, not to eye damage. In addition, prosopagnosia frequently is accompanied by central achromatopsia, the acquired inability to perceive color as a consequence of central nervous system disease despite adequate retinal function. Visual agnosia also is often present. Visual agnosia is normal ability to see and perceive without the ability to give meaning to what one sees. Normal visual acuity, visual scanning, and visual perception must be demonstrable in an individual diagnosed with visual agnosia. Despite the adequacy of visual skills, the individual is unable to recognize what is seen. Difficulty in identification is not a consequence of deficits in language or cognition. Indeed, many of these patients can recognize objects once they touch them, or once their function is described to them.

Historically, there has been substantial contention about the localization of the brain lesion producing prosopagnosia. Initially, most authors identified the necessary lesion as restricted to the right hemisphere (Hecaen & Albert, 1978), as many of the individuals who had prosopagnosia had left-sided visual field defects indicative of right hemisphere pathology. Recent studies using both radiologic and autopsy findings suggest that prosopagnosia requires bilateral damage to the mesial and inferior visual association cortex (Damasio & Damasio, 1983; Damasio, Damasio, & Van Hoesen, 1982).

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VISUAL IMPAIRMENT VISUAL PERCEPTION AND DISCRIMINATION VISUAL TRAINING

PROTECTION AND ADVOCACY SYSTEM— DEVELOPMENTALLY DISABLED

The protection and advocacy system (P&A) was established under federal legislation for the developmentally disabled (Section 113, PL 94-103). Each state or territory receiving funding from the Administration on Developmental Disabilities is required to have a P&A agency. The P&A agencies must be independent of any other state agency or governmental unit to ensure their ability to freely protect and advocate the rights of developmentally disabled (DD) individuals.

Activities of P&A staff may involve negotiation, administrative or legal remedies on behalf of clients seeking programs, services, or protection of clients' rights as DD citizens. The agency's staff is also responsible for information dissemination concerning the rights of DD clients. Activities include presentations and workshops for lay and professional groups on the rights of the disabled. Areas such as education, employment, transportation, housing, architectural barriers, and legal aid are concerns of a P&A agency. The P&A office for each state or territory may be located through the Office of the Governor or by contacting Commissioner, Administration on Developmental Disabilities, OHDS/HHS, Washington, DC 20201.

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PRUNE BELLY SYNDROME

See NATIONAL ORGANIZATION OF RARE DISORDERS.

PSYCHOANALYSIS AND SPECIAL EDUCATION

Until the beginning of the twentieth century, mental illness was believed to be the result of biological and organic factors residing within the individual. Sigmund Freud, who was a practicing physician and neurologist at the turn of the century, began to doubt that the hysterical reactions he was treating in his patients had solely an organic basis. Freud formulated an alternative theory to the development of personality that has subsequently had a profound effect on the way the behavior of an individual is explained. From Freud's

psychoanalytic point of view, the psychological processes are the primary determinants of emotionally disturbed behavior. Psychological processes include all mental operations, thoughts, emotions, desires, needs, and perceptions.

Psychoanalysis is a specialized technique in which the individual verbalizes all of his or her thoughts and feelings without censorship (Finch, 1960). Freud's theory holds that individuals are only minimally aware of the causes of their behavior. Behavior is propelled by unconscious forces that are too threatening to be part of the conscious. In treatment, patients are taught to free associate to understand the meaning of their behavior and become better acquainted with the unconscious. Eventually, basic conflicts emerge and are understood and dealt with by the individual. Psychoanalysis is a long, tedious, and complex process that has had limited use in the schools (Finch, 1960). It is based on a medical or disability model where the pathology is believed to reside within the individual. To educators who do not have extensive training in psychology or, more specifically, psychoanalysis, the process seems complex and mysterious. Teachers prefer to refer students with emotional problems to outside agencies or self-contained special education classes rather than to risk making a serious mistake that would do further damage to the student.

Newcomer (1980) discusses both the positive and negative contributions of psychoanalysis to special education. There is the notion in psychoanalytic theory that personality characteristics are determined by childhood events; thus, pathology would develop before a child arrives in school. The problems in school are caused by disorders that are within the child. Therefore the strategies for remediation focus on the child and the family rather than the school. This may result in the school having a passive role in resolution of the conflict.

In addition, because of the psychoanalytic belief that abnormal behaviors are symptoms of unconscious conflicts and that resolution lies in open expression, educators are encouraged to treat disturbed children carefully to avoid repressing their behavior. A nonrepressive environment often provides little structure, and the expectations for normal behavior are reduced. Teachers are encouraged to stop teaching content material until the child's behavior is stable (Newcomer, 1980). It is not clear that this is the most effective way to deal with abnormal behavior. However, there has been a longstanding close association between special education and psychoanalysis in terms of understanding and providing for the needs of students (Pajak, 1981). Psychoanalytic theory has promoted the idea that children do not always consciously plan and cannot always control their disruptive behaviors, but they do respond to internal conflicts (Newcomer, 1980). These beliefs have resulted in more understanding and less primitive treatment of children with emotional disturbance.

Significant contributions to psychoanalysis and special education have been made by Bruno Bettelheim and Fritz

Redl (Haring & Phillips, 1962). Their approaches have been primarily permissive in nature, and school work is often used as a vehicle to assist the child in bringing the unconscious conflict to a conscious level of awareness. In general, special education programs have moved from child-directed, psychoanalytic models to more teacher-directed behavioral models where emphasis is primarily on academics and behavior control. IDEA mandates teaching students in the least restrictive environment. Therefore, the emphasis in special education is on teaching children appropriate and acceptable behavior in school, which is in conflict with the free and open expression advocated by Freud and his followers.

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CHILD PSYCHIATRY PSYCHODRAMA PSYCHOTHERAPY WITH INDIVIDUALS WITH DISABILITIES

PSYCHODRAMA

Psychodrama is a method of group psychotherapy devised and developed by Moreno (1946). Psychodrama requires a well-trained therapist, preferably one with special certification as a psychodramatist. Psychodrama consists of using dramatic techniques with clients who act out real-life situations, past, present, or projected, in an attempt to gain insight into their behavior and emotions. Psychodrama also provides the opportunity to practice specific behaviors in a supportive group atmosphere. The method of psychodrama integrates insight and cognitions with experiential, participatory involvement, taking advantage of the group

therapy setting and using physical movement to bring non-verbal cues to the client's attention. This component of psychodrama can be crucial in therapy with individuals who have limited verbal skills, particularly children and delinquent adolescents (Blatner, 1973). Another significant advantage of psychodrama is its ability to convert the child or adolescent's urge to act out into a more constructive form of "acting in," with guided role playing.

Many production techniques have been devised since psychodrama was introduced, including the auxiliary ego, the double, and the soliloquy. Important to the success of psychodrama is a time for warm-up at the beginning of each session. Participants must also know that the dramatic qualities of the production are not being evaluated, nor are they crucial to the success of therapy. Trust and support of the group are far more important. The role of the director (the psychodramatist) is primarily one of keeping the action moving and helping to lead the participants toward a resolution of the problem situation presented. Keeping the audience (the remainder of the group) involved is also an important role for the director. Three phases will typically constitute a psychodrama, the warm-up phase, the action phase, and the discussion phase.

Psychodrama can be a particularly useful form of psychotherapy with children and adolescents with a variety of behavior disorders. It offers an opportunity for understanding and gaining insight, but it also offers a setting for the development of alternative behaviors and an opportunity for rehearsal in a realistic and supportive setting.

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SOCIODRAMA

PSYCHOGENIC MODELS

Psychogenic models present causes of human behavior in terms of the psychological functioning of the individual. The cognitive and emotional aspects of personality are central to explaining behavior. The psychogenic approach emphasizes emotional distress as the root of deviant behavior (Bootzin, 1984). The model stands in contrast to the biogenic approach in placing little emphasis on the physiological factors underlying behavior.

Psychogenic models, however, emphasize factors internal

to the individual as mechanisms of behavior. For example, personality integration is the central construct of psychological definitions of mental health (Freeman & Giovannoni, 1969). The effects of the ecology of the family or school are mediated by psychological factors, and changes in behavior result from improvements in psychological functioning. The psychogenic model may share with the biogenic model a tendency to blame the victim.

Balow (1979) noted that psychological models are compatible with special education practice because most educational interventions are based on psychological principles. The models, techniques, and measurements of special education used to be expressed typically in terms of psychological function of individual students. The current focus in special education has moved away from the psychogenic model and is much more based in outcome assessments and are more focused on outcome.

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BIOGENIC MODEL OF BEHAVIOR ETIOLOGY

PSYCHOLINGUISTICS

Psycholinguistics refers to the study of language and how individuals acquire, use, and understand language in their daily lives. Initial investigation and study in psycholinguistics was based in philosophy and anthropology; with the work of people like van Humboldt, Wundt, and others, psychology added to what is known about the acquisition of language (Lahey, 1988). Despite the theoretical basis to the initial joint interest in language development, psycholinguistics has become a field of interest for professionals in a multitude of fields, including psychiatry, education, and cognitive psychology.

In the field of education, the interest in psycholinguistics is related to the understanding and increased awareness that atypical language development may underlie many learning, behavior, and psychiatric disorders (Carroll & Snowling, 2004; Clegg, Hollis, Mawhood, & Rutter, 2005; Tallal, 2004). Atypical language development sufficient to

warrant identification as speech-language impairment (SLI) occurs in approximately 3 to 15 percent of children ranging in age from 3 to 21 years (American Psychiatric Association, 2000; Riccio & Hynd, 1993). In a large scale epidemiological study, 7.4 percent of kindergarten children were identified as delayed in language areas (Tomblin et al., 1997). Thus, disorders of language are among the most common disorders of higher cerebral function in children. Further, the prognosis for these children, based on retrospective data, is relatively guarded, with a direct relationship between prognosis and the severity of the language impairment (Aram, Ekelman, & Nation, 1987; Lahey, 1988).

Children with SLI typically exhibit limited vocabulary knowledge, underdeveloped or unusual syntax, and impaired grammatical morphology (Bishop, 1992). These language deficits hinder a child's ability to acquire new vocabulary, leading to deficits in global language learning and academic difficulties. Given the relative frequency of SLI in children, it is important for those professionals who work with these children (e.g., teachers, speech-language pathologists, school psychologists) to have some understanding of the cognitive, academic, and behavioral characteristics associated with differing subtypes of SLI in order to most effectively meet the needs of these children. It has been argued that language impairment and learning disabilities are often only distinguished by the age of the child at the time of diagnosis (Carroll & Snowling, 2004; Kamhi & Catts, 1986). Where the SLI is less severe, language problems may not be recognized until school entry. With elementary school children, the problem lies in the presentation of SLI as a learning disability. Language disorders can often be quite subtle and may manifest as a learning disorder rather than language impairment because these language problems surface in the child's difficulty in learning to read, difficulty keeping up with peers, difficulty attending to group lessons, and difficulty with organization (Tallal, 2004).

One of the more difficult tasks facing clinicians is that of differential diagnosis of SLI as opposed to hearing impairment, global intellectual disability, and Pervasive Developmental Disorder/Autistic Spectrum Disorder. This is particularly true of Pervasive Developmental Disorder, where the chief complaint of parents is frequently that of language disorder. Early diagnosis of SLI is often further hampered because the child may appear to be intellectually disabled. Further, it has been found that preschool children with SLI frequently demonstrate behavior problems (e.g., hyperactivity, inattention, social withdrawal, immaturity, dependency). It has been suggested that these behavioral problems may be secondary to the SLI (Clegg et al., 2005).

Given the high frequency of children, youth, and adults affected by language deficits, and the potential impact on educational outcome as well as psychosocial adjustment (Clegg et al., 2005; Tallal, 2004), there is much additional research to be done concerning the best means for prevention,

identification, and intervention of language disorders. It is generally agreed that multiple factors (e.g., biological factors, environmental factors, psychological factors) all contribute to language development (e.g., Lahey, 1988); the interaction of these factors suggests that the area of psycholinguistics will continue to be one of interest across fields with increased research collaboration in the years to come.

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DYSLEXIA EMOTIONAL DISORDERS LANGUAGE DISORDERS

PSYCHOLOGICAL ABSTRACTS

Psychological Abstracts (PA) provides nonevaluative summaries of the world's literature in psychology and related disciplines. Over 950 journals, technical reports, mono-

graphs, and other scientific documents provide material for coverage in PA. *Psychological Abstracts* includes bibliographic citations or annotations that are used to cover books, secondary sources, articles peripherally relevant to psychology, or articles that can be represented adequately in approximately 30 to 50 words. Since 1967 the abstracts have been entered into machine-readable tapes that now provide the basis for the automated search and retrieval service known as Psychological Abstracts Information Service (PsychINFO).

As psychology has multiple roots in the older disciplines of philosophy, medicine, education, and physics, the vocabulary of psychological literature is characterized by considerable diversity. Each new generation of psychologists added to the vocabulary in attempting to describe their research and perceptions of behavioral processes. As a result, the American Psychological Association standardized the vocabulary by designing a *Thesaurus of Psychological Index Terms* in 1974, a few years after establishing the computerized version of PA. By 1967 there were over 800 terms that indexed psychological research and writing. In 1974, when the first *Thesaurus* was published, the index and terms were based on the frequency of the occurrence of single words in titles or abstracts in PA over the preceding years. The *Thesaurus* was revised in 1977 and 1982. Each entry in the *Abstracts* and the PsychINFO system is indexed for retrieval by one or more *Thesaurus* index terms, which reflect broader, narrower, and related terms that may describe content in the article. In addition, each article is identified as belonging to one of 16 major content categories and 64 subcategories.

Using these index and content classification terms enables the user to locate articles of interest for hand searches of PA issues or for computerized retrieval from the PsychINFO system.

Further information about PA or the PsychINFO system can be obtained from the American Psychological Association, 750 First St., N.E., Washington, DC 20002-4242, or by telephone at (202)336-5568.

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PSYCHOLOGICAL CLINICS

University psychological clinics are generally student training facilities that have a cooperative relationship with the

surrounding community. The clinics provide undergraduate and graduate students in disciplines such as education, counseling, and psychology with an opportunity to apply their theoretical and technical knowledge in working with a variety of clients in a closely supervised practicum. Individuals from the communities surrounding the university psychological clinics are able to receive innovative, state-of-the-art evaluations and treatments at reasonable fees from professionals in training. Each clinic usually has a director who is responsible for the coordination and overall functioning of the clinic and each student's activities are generally scrutinized by one or more qualified supervisors (i.e., licensed psychologists, speech pathologists, or special educators). A number of types of services are usually offered in the psychological clinics, including: child assessment and treatment; parent training; family counseling; teacher consultation; program evaluation; and organizational consultation. Therefore, the clinic provides clients with a wide array of psychological services and the students in training with exposure to a number of different approaches to a particular problem.

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CHILD GUIDANCE CLINIC COLLEGE PROGRAMS FOR DISABLED COLLEGE STUDENTS

PSYCHOLOGICAL CORPORATION

The Psychological Corporation was the world's oldest and largest commercial test publisher. It was founded in New York City in 1921 by three noted professors from Teachers College of Columbia University: James M. Cattell, Edward L. Thorndike, and Robert S. Woodworth. Over its 65-year history, the corporation's primary mission has been the application of principles of psychology and measurement to the solution of educational, clinical, industrial, and social problems. On the eve of its fiftieth anniversary, the Psychological Corporation merged with the test department of Harcourt, Brace, & World, and in 1975 it became a subsidiary of Harcourt Brace Jovanovich. Growth in development programs, services, and professional staff required the corporation to move from New York to Cleveland, Ohio, in 1983. The corporation continued to expand rapidly, employing over 200 people, including 50 psychologists specializing in measurement, child development, and education, by 1985. In 1986 the corporation relocated to permanent headquarters at 555 Academic Court, San Antonio, Texas 78204, with field offices in New York, Chicago, Atlanta, San Diego, Orlando, and Toronto.

The corporation is well known for high-quality educational and psychological tests. Names such as the Wechsler Intelligence Scales for Children—Revised, Children's Memory Scales, McCarthy Scales of Children's Abilities, Baley Scales of Infant Development, and Stanford Diagnostic Reading and Mathematics Tests are familiar to scholars throughout the world. The corporation also provides tests and services to many of the nation's largest companies, government agencies, and health care institutions, and holds contracts for large-scale assessment programs in English- and non-English-speaking countries worldwide. The corporation now publishes over 200 tests and has a computer software development program. In the late 1990s, the company was acquired by Elsevier Science and in 2004 was renamed Harcourt Assessment.

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PSYCHOLOGICAL REPORTS

Psychological Reports is published bimonthly, two volumes a year, the first with issues in February, April, and June and the second with issues in August, October, and December. Between 2000 and 3000 pages are published annually. Approximately one-third of the articles come from outside the United States. The purpose of this journal is to encourage scientific originality and creativity in the field of general psychology for the person who is first a psychologist and then a specialist. It carries experimental, theoretical, and speculative articles; comments; special reviews; and a listing of new books and other materials received. Controversial material of scientific merit is welcomed. Multiple referees examine submissions. Critical editing is balanced by specific suggestions as to changes required to meet standards (Ammons & Ammons, 1962a).

The complete publication process requires as little as 8 to 12 weeks. Distribution of the journal is international. Abstracts appear in standard outlets (e.g., *Psychological Abstracts*), in numerous on-line services for special interest areas, and in journals with particular emphases. A survey made in 1985 (the thirty-first year of publication) showed that *Psychological Reports* appeared in the top 5 percent of psychology journals for number of citations of articles and number of refereed, selected archival articles published, and that it had held that position for the preceding decade. The journal has consistently maintained for 30 years a policy of being highly experimental, open to all defensible points of view, encouraging of new and often unpopular ways of looking at problems, and protective of authors by careful but open-minded refereeing and editing (Ammons & Ammons, 1962b).

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PSYCHOLOGY IN THE SCHOOLS

Psychology in the Schools began in 1964 with William Hunt serving as editor. He was followed briefly by B. Claude Mathis and then in 1970 by Gerald B. Fuller of Central Michigan University, who remains as editor. In an attempt to meet the practical needs of professionals in the field, this journal emphasizes an applied orientation. It addresses practicing school and clinical psychologists, guidance personnel, teachers, educators, and university faculty. Articles of preference clearly describe the relevancy of the research for these practitioners. However, occasionally important experimental and theoretical papers may be included.

The major areas of focus include (1) theoretical papers and interpretive reviews of literature when these relate to some aspect of school psychology; (2) opinions that are well formulated and presented; (3) treatment and remediation approaches; (4) evaluation of treatment and remediation or other program evaluations; (5) deviant or atypical features of the behavior of school children; (6) social or group effects on adjustment and development; (7) educational, intellectual, and personality assessments; (8) etiology and diagnosis; and (9) case studies. These areas are grouped into four categories within the journal: evaluation and assessment; educational practices and problems; strategies for intervention; and general topics.

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PSYCHOMETRICS

See MEASUREMENT.

PSYCHOMOTOR SEIZURES

The term psychomotor was introduced in 1938 by Gibbs and Lennox (Lennox & Lennox, 1960) to describe epileptic

manifestations composed of various multiple psychic or motor activities. These manifestations are associated with spikes, sharp or slow waves on the electroencephalogram over the anterior area of the temporal lobe; therefore, the manifestations are also called temporal lobe seizures. According to the classification of the International League Against Epilepsy (1981), the seizures are partial, as they begin locally, and also complex, as they are associated with "a clouding of consciousness and complete or partial amnesia for the event" (Livingston, 1972). They may be followed by generalized tonic-clonic seizures.

Psychomotor seizures are more frequent in older children, adolescents, and young adults (Currie et al., 1971; Gastaut, 1953; Livingston, 1972). However, Holowach et al. (1961) and Chao et al. (1962) reported this kind of seizure in 11 and 15.7 percent of children with all types of epilepsy up to 15 years of age. The onset occurred before the age of 6 years in more than 50 percent and before the age of 3 years in almost 30 percent.

As in every partial seizure, the temporal lobe epilepsy may start with an aura that is the first subjective and remembered symptom of the seizure. This aura is indicative of the starting point of the fit, and sometimes of its spreading. In psychomotor epilepsy, the wide variety of symptoms, sensory, motor, or mental, are due to the structures encountered in the temporal lobe area, such as the temporal convolutions, the cortex in the fissure of Sylvius, the insula, the amygdaloid nucleus, the uncus, and the hippocampal zone. The International League Against Epilepsy (1985) proposes to classify the multiple clinical pictures into four subtypes: hippocampal (mesiotemporal limbic or primary rhinencephalic psychomotor), amygdalar (anterior polar amygdalar), lateral posterior temporal, and opercular (insular) epilepsies. The symptoms may be motor, sensory, or psychic, appearing simultaneously or consecutively, but they present some clinical patterns (Chao et al., 1962; Gastaut, 1953; Holowach et al., 1961; Livingston, 1972).

Young children may, as an aura, run to their mother with fear or complain of gastric discomfort or unpleasant smell or taste before the loss of consciousness. The symptoms often start with an arrest of motion, with eye staring eventually followed by simple and/or complex automatisms such as repetitive oral movements (e.g., lip smacking, chewing, and swallowing; Ebner, Noachter, Dinner, & Lueders, 1996; Serafetinides, 1996). The motor activities, like rubbing the face, fumbling with buttons of clothing, or wandering around the room, appear purposive but inappropriate at the time. Speech may become incoherent or mumbled. Autonomic disturbances such as urination, vomiting, salivation, or flushing of the face may be present. Awareness is impaired and amnesia of the attack is a fairly constant finding. The episodes are not very frequent (from one to five per day to one to five per month) and usually brief, 2 to 3 minutes, but the return to consciousness is often gradual. Mental or psychic seizures are variable, but visual or auditory hallucinations are frequent and owed to connections with the vicinity.

Affective manifestations such as fear or aggressiveness are frequently present. The attack may terminate in a grand mal seizure. The symptomatology is often associated with mental retardation, cerebral palsy, and hyperkinetic syndrome (as with any organic brain disorder of childhood).

In children the etiology is most often the result of a chronic, nonprogressive neurologic disease. The seizures may be due to previous insult to the brain in the neonatal period as in hypoxia, infection, trauma, or congenital malformations, but also to severe or prolonged seizures in early life or to febrile convulsions. Tumors are rare. Often, no definite cause can be established (Gomez & Klass, 1983). The most common abnormality is mesial temporal sclerosis (incisural sclerosis). The prognosis is better than previously thought (Lindsay et al., 1979; Staff, 1980), and treatment is mainly medical through drug therapy.

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ABSENCE SEIZURES SEIZURE DISORDERS

PSYCHOMOTRICITY

An independent science firmly established in France, psychomotricity is based on the interdependence of physical, affective, and intellectual functions and thus covers a wide field that encompasses neurology, pedagogy, and psychoanalysis.

Numerous scientific ideas from various disciplines have contributed for more than a century to the elaboration of the concept of psychomotricity. Near the end of the nineteenth century, scientific achievements made it necessary to abandon Cartesian dualism, which separated body and mind and led to a mechanistic approach to the body. Instead, the integrative action of the nervous system and its role in the regulation of the organism interacting with its environment were stressed. Neurophysiologists started to examine the bases of tonus and movement (gamma loop and Renshaw recurrent circuit, cerebellum, subcortical nuclei, neocortex, etc.). Penfield's center-encephalic theory of motor adjustment (counter to traditional associationism) underscored the importance of the basal centers and their integrating role, and of the vertical cortical-subcortical relationships.

Dupré, a neuropsychiatrist, described the syndrome of motor deficiency in relation to mental deficiency and compared it with the immature state of newborn babies (limb hypertonicity, enuresis, etc.). For the first time, motricity and intelligence were linked.

In *La naissance de l'intelligence chez l'enfant* (1936), Piaget stated that the first stage in the development of intelligence is the coordination of sensorimotor schemas (i.e., feeling and movement systems such as suction, sight, prehension, etc.) leading to adaptations and assimilations that enable the individual to reach a higher (preoperative) type of intelligence. Piaget's ideas were developed further. De Ajuriaguerra showed that the tonic state is used by the newborn baby as a mode of relation (e.g., crying hypertonicity, contentment hypotonicity). A structuring dialogue actually takes place between mother and child. Wallon studied the relationship between motricity and character (*L'enfant turbulent*, 1925). He described the body image as a progressive construction involving all our perceptive, motor, and affective experiences. Phenomenology, too, played a role in the coming about of psychomotricity. It gave birth to the gestalt theory, in which every physical or psychological phenomenon is seen as an indivisible whole known as the form. This theory helped shape the notions of body schema, behavior, and movement. According to Merleau-Ponty and Buytendijk, the different types of behavior are modalities of the *in-der-Welt-sein*, that is, of mind and body as they

interact continuously in the flow of life. Thus, in the phenomenal world body and mind were no longer separated and psychomotricity could enter the field.

Psychoanalysis also contributed to the elaboration of the concept. The body was defined as a scene of pleasure, and psychic development was divided into organic stages: oral, anal, phallic, and genital. Moreover, it was contended that an organic or perceptual-motor function could be used effectively only if it had been effectively invested. An emotional disorder can easily bring about physical dysfunctions such as conversion hysteria or organic neurosis. Reich stated that the social-emotional state of a person influences his or her tonic state (tension rings). The ethology of the child also played a role. Montagner gave a minute description of the child's behavior in the nursery and highlighted socio-affective correlations.

In France, psychomotricity was recognized as a discipline in the early 1960s. The first French Psychomotricity Charter (de Ajuriaguerra-Soubiran) was promulgated and a curriculum was created. A trade union and various publications came about.

As far as practice is concerned, a distinction is usually made between education, remedial work, and therapy. Education aims at stimulating the healthy child's psychomotor functions. This concept is slowly spreading in nursery schools. Remedial exercises aim at improving psychomotor symptomatology through a reprogramming of the neuromotor sphere. Model lessons by the well-known team of the Henri-Rousselle Hospital in Paris are available. Therapy aims at deblocking and developing the disturbed child's psychic structures through bodily and relational interaction with the therapist and mediatory objects. According to Aucouturier, technicity consists of working out sensorimotor pleasure and treatment of aggressive and fantasmatic productions. These various approaches are used primarily with children up to 7 years of age when symbolizing processes enable them to dissociate themselves from their bodily experiences. However, the concept of psychomotricity applies in theory to every stage of life.

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PSYCHONEUROTIC DISORDERS

The term psychoneurotic as a description of childhood emotional disorders is associated with the psychoanalytic

tradition of Sigmund Freud. It is a general term that has been applied to specific clinical syndromes, including phobias, anxiety reactions, obsessive-compulsive behavioral patterns, and hysterical or conversion disorders. Anxiety is postulated by all authorities as being the prime causal process in these clinical syndromes. Some authorities also include childhood and adolescent depressive reactions under the conceptual rubric of psychoneurotic disorders.

Obsessive-compulsive neurosis is characterized by recurrent thoughts or actions that the child feels he or she must think about or perform. To the objective outside observer, these appear to be irrational ideas and unnecessary or ridiculous behaviors. The obsessive child is seen as a highly anxious child whose obsessional thoughts and compulsive behaviors are a way to defend against intense anxiety. Unfortunately for the child, this cognitive and behavioral style never totally alleviates the anxiety and often leads to new problems in adapting to the social environment.

Virtually all people have occasional obsessive thoughts. A highly valued activity may lead to recurrent thoughts and excitement, or a catchy tune may roll over and over in one's head. Clinicians also observe a degree of compulsiveness in anxious children that, while of a significant proportion, does not occur with enough frequency or intensity to warrant the diagnosis of an obsessive-compulsive syndrome. For example, a 9-year-old boy was seen for an evaluation. Psychological tests revealed a clear compulsive style in executing a variety of cognitive and educational tasks. He was a slow worker with perfectionistic tendencies who functioned at a fairly high level academically and socially. His role in the family was that of a "pleaser." His sister had recently been discharged from a psychiatric hospital after a suicide attempt, and there was an inordinate amount of external stress on the family. It was clear that this child was developing a compulsive behavioral style in defense against the insecurity he felt as a member of this family system.

When the obsessive compulsiveness reaches a high degree, the child can become extremely dysfunctional. Obsessive compulsive children are haunted by extreme irrational thinking and ritualistic behavioral patterns. Kesler (1972) classifies obsessional fears experienced by such children into two types. The first is precautionary fear, which includes worries about one's health, safety, or cleanliness. The second is repugnant fears such as concern that one might engage in sexual abnormalities or some type of conspicuously taboo behavior. Kesler also suggests that compulsive acts can be dichotomized into those that are precautionary such as washing one's hands repeatedly to rid oneself of germs, and those that act as self-punishment such as compulsive counting or bed making.

It should be stressed that the diagnosis of this disorder is made only when the pattern leads to dysfunctional behavior and that a certain degree of compulsive traits are functional. Attention to cleanliness and detail can be very helpful in participation in the family and performing well in school. A

bedtime ritual such as reading stories before bed is a beneficial quieting behavior at the end of the day. Few teachers complain about elementary school children who have their desks neatly organized each school day. Most authorities agree that the incidence of obsessive-compulsive disorders is extremely rare (Achenbach, 1974). It appears to be roughly equally distributed among both sexes (Templer, 1972).

Conversion reaction also is described as hysteria. It is most closely associated with the psychoanalytic tradition. Anxiety is presumed to be converted into physical complaints and illnesses. A hysterical syndrome can be contrasted with a psychosomatic disorder in that the former has no medical basis and may be totally contradicted by medical findings. The types of physical symptoms that may represent conversion reactions are almost limitless. Sometimes they mimic known physical diseases and specific organic dysfunctions such as blindness.

A clinical case demonstrates the unique form that conversion reactions can take. A 14-year-old girl was seen for the presenting complaint of a sudden onset of the inability to read normally. She was, in fact, reading backward in mirror-image form. Examinations by a neurologist and an ophthalmologist suggested there was no organic basis for the problem. The case was treated as a conversion reaction. Individual psychotherapy revealed a highly stressful family environment. The father suffered from a terminal illness. Emerging adolescent sexuality also was an issue. The girl was very afraid of growing up and was treated like a young child by the family. The inability to read was treated as a manipulation to avoid these developmental issues. Both the patient and her family denied that this was a psychologically caused symptom. Denial is common among hysterical syndromes. An unorthodox paradoxical treatment approach was employed whereby the girl was not allowed to read and was given the message by the parents that she needed to be more independent and grown up. After much hostility and acting out behavior by the patient, she did begin to read again. It is noteworthy that when stress again peaked several months later, the same symptoms resurfaced. They again remitted with treatment.

Most approaches to the study of psychoneurotic abnormalities follow either a psychoanalytic theory or a learning-behavioral approach. Each theoretical orientation has a substantial following and, at this point, there is no basis for rejecting or accepting the superiority of one approach over the other for the treatment of psychoneurotic dysfunction. Each of these two general theoretical frameworks also have application to the explanation and treatment of a wide range of abnormal behaviors.

The psychoanalytic approach is primarily based on Freud's theory of neurosis. According to this approach, psychoneurotic manifestations result from the individual's response to unconscious conflicts involving sexual and aggressive impulses. At the center of Freud's theory is his emphasis on defense mechanisms, particularly repression.

In hysterical behavior, the affective arousal (presumed to be sexual in origin) is pushed out of consciousness and converted into somatic complaints. According to Freud, the obsessive-compulsive child, in contrast, is unable to convert anxiety into physical symptoms so repression is used to destroy the emotional link between an unacceptable idea and the feelings about it. The obsessive can be aware of the unacceptable idea, but manages to keep from thinking about it.

The sexual conflict that leads to neurotic symptoms was postulated by Freud to involve a conflict between the ego, or the child's emerging personality structure, and the libido, the unconscious psychological energy. Symptoms reflect this conflict between the ego and unacceptable ideas. Freud's theory, often labeled the libido theory, proposes that the effect of excitation can be displaced, discharged, or converted into other forms such as bodily or compulsive behaviors. For more complete descriptions of the psychoanalytic theory of neurosis, including Freud's revision of his theory in 1923, see Kesler (1972) or Achenbach (1974).

A learning theory approach discounts the importance of internal unconscious impulses or a personality structure. The learning theorist traces the cause of anxiety to specific environmental circumstances. The operant conditioning paradigm focuses on environmental or behavioral contingencies that reinforce symptomatic behavior (e.g., make it more likely to be repeated). Psychoneurotic symptoms emerge as a way of reducing the aversive effects of feeling anxious; in this way they reinforce the hysterical or obsessive-compulsive behaviors. The reinforced behavior can be generalized to different but similar situations. Thus the learning theory approach discusses complex associations that are learned as the child attempts to cope with anxiety.

Conversion reactions and obsessive-compulsive disorders have traditionally been treated with individual psychotherapy from a psychoanalytic approach. Behavioral approaches have been more frequently applied to the anxiety disorders such as phobias where their efficacy is well established. Noticeably fewer applications of behavioral therapy to obsessive-compulsive and conversion reactions have been reported. Psychodynamic individual therapy with children with these disorders is based on the intensity of the relationship between the child and the therapist. This approach attempts to examine the intrapsychic conflicts that produce the anxiety and then the psychoneurotic disorder. Play therapy is often used for younger children as part of the therapeutic process so that the child can express his or her conflicts through play. The Freudian approach emphasizes that the symptom must be removed by resolving the basic conflict. Otherwise, it is postulated that symptom substitution will occur where the intrapsychic conflict that is left unresolved will resurface in the form of a different pattern of abnormal behavior.

In contrast, behavior therapists reject the notion of symptom substitution and directly attack the symptom or prob-

lem behavior. Reinforcement contingencies may be set up by the therapist and implemented by the significant adults in the child's life. The problem behaviors would no longer be positively reinforced and may be negatively reinforced; more appropriate ways of responding would be positively reinforced with the goal that the child would learn new ways of coping with anxiety. For example, in the classroom setting, the teacher, after consultation with the therapist, would implement responses to compulsive behavior by the child that would encourage the child to be less perfectionistic and work at a greater rate of speed. The case of the 14-year-old with conversion reaction discussed at the beginning of this entry illustrates a behavioral intervention following a psychodynamic formulation. The secondary gain from the conversion reaction behavior (i.e., failing to read) was eliminated. The child was not allowed to read and did not receive special tutoring at school. Emphasis was placed on normal social behavior involved with growing up and focus was shifted away from the symptom.

Family therapy is usually a valuable, if not necessary, adjunct to individual therapy for psychoneurotic children. Recent trends are highlighting short-term dynamic psychotherapy, probably as a response to managed care as well as progression in theory (Davanloo, 1995). The traditional psychoanalytic point of view would assign a separate therapist to work with the parents while the individual psychotherapist worked with the child. More often today, the same therapist works individually with the child and consults with the parents. Family therapy sessions may also be held. The behavior therapist often consults with the parents on specific behavioral interventions that they could make at home. In this way, the parents become collateral therapists. School consultation is frequently a valuable adjunct to effective intervention. The therapist can educate the teacher on the nature of the problem and give suggestions for appropriate responses. These teacher behaviors might include being more patient, as in the case of a conversion reaction or excessive compulsivity; specific behavioral interventions by the teacher can play an important role in changing behavior. Drug therapy is generally inappropriate for these disorders, as there is little evidence of biological causes. An exception would be if a parallel disorder, such as depression in an older adolescent, called for antidepressant medication.

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ANXIETY DISORDERS

CHILDHOOD PSYCHOSIS

DEPRESSION, CHILDHOOD AND ADOLESCENT

EMOTIONAL DISORDERS

SERIOUSLY EMOTIONALLY DISTURBED

Davies, R. R., & Rogers, E. S. (1985). Social skills with persons who are mentally retarded. *Mental Retardation*, 23, 186–196.

Erickson, E. H. (1963). *Childhood and society* (2nd ed.). New York: Norton.

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EMOTIONAL DISORDERS

FAMILY COUNSELING

FUNCTIONAL ASSESSMENT

SOCIAL SKILLS INSTRUCTION

PSYCHOPATHY

See SOCIOPATHY.

PSYCHOSIS, AMPHETAMINE

See AMPHETAMINE PSYCHOSIS.

PSYCHOSOCIAL ADJUSTMENT

Psychosocial adjustment refers to social and emotional functioning: the way a person relates to and interacts with other people in his or her environment. It is one noticeable area of difference between special needs students and those labeled normal. While problems in psychosocial development and intrafamily relations may contribute to later psychosocial difficulties (Erickson, 1963), a behavioral analysis position (Bryant & Budd, 1984) emphasizes the importance of environmental stimuli in reinforcing and maintaining appropriate social skills.

A number of remedial techniques have been used when an exceptional child exhibits psychosocial problems. Often parents can be taught to provide a more positive family environment and to more effectively communicate with their child. In school and during play, specific appropriate social behaviors, such as approaching other children, sharing, and playing social games, can be targeted for training and shaping using reinforcement techniques (Davies & Rogers, 1985). A high density of positive reinforcement for correct approximations of social contact may also be used to strengthen appropriate social relationships.

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PSYCHOSOMATIC DISORDERS

The somatic expression of anguish is a frequent phenomenon in childhood and adolescence. More than 90 percent of children between the ages of 3 and 18 years have established a psychological relationship with the surrounding world and expressed a confusion in a psychosomatic form at some time during their development. Somatic expression in childhood is always bound with anxiety either in reaction to a situation objectively traumatic or in relation to the perceptive distortion of an objectively nontraumatic situation. Somatic expression in the child in regard to the adult is specific and evolutionary in relation to the maturational stage of the child (affective and neurological). It is associated with a quantitative or qualitative deficiency in the parent/child relationship, most often with the mother.

Somatizations are frequent in the everyday life of a family, and are expressed through abdominal pain, headaches, fatigue, syncopal tendencies, and breathing difficulties without any objective clinical manifestation. The causes are multiple and often related to situational stress, e.g., divorce of the parents, death, academic examinations, personal crises, and approaching adolescence. Through somatic symptoms, the child frequently aims to provoke a modification in the family system by focusing the tension on himself or herself. Sometimes the child preserves the equilibrium of parents who are ready to break down. There is always a message in somatization; it is chosen consciously or unconsciously by the child in families where only this type of expression is tolerated. The underlying personality is not specific but is generally strong. The somatization is a means of expression limited in time and related to a difficult situation experienced by the child that could regress through verbal exchanges and dramatization. At times, somatization presents itself in a family context called psychosomatic and is characterized through a systematic avoidance of conflicts, enmeshment of roles, pseudomutuality, and functional rigidity. The treatment will then be systemic (familial). The somatization cannot

be underestimated even if physical examination is normal; the symptoms are real. It is not a simulation, and the symptoms must be seriously taken into account and the context carefully analyzed.

Psychosomatic diseases of children differ from those of adults and result from the conjunction of various factors. A calendar of psychosomatic diseases exists: colic at 3 months, vomiting at 6 months, eczema between 8 and 12 months, breath-holding spells at 2 years, abdominal pain at 3 years, asthma at 5 years, headaches at 6 years, and Crohn's disease at adolescence. The development of a psychosomatic syndrome is associated with (1) a genetically fragile somatic background (repetitive infections); (2) a precocious inappropriate parent-child relationship (rejection, overprotection, aggression, anxiety); (3) physical stress (allergene) or psychological reactivation of a previous problem of anguish until compensated; and (4) a familial functioning of the psychosomatic type. According to age, the prevalent etiology, and the therapeutic possibilities, the treatment will be made along an organistic or psychological point of view, individually or familial, and symptomatic or global.

Every serious somatic disease is stressful for the child, the family, and those surrounding the child (teachers, grandparents, etc.). The factors of adaptation are related to the nature of the disease itself, to the child (age and personality), and to the possibilities of modification in the functioning of the family facing a distressing situation, e.g., new context of life, hospital, family doctor. Frequently the child uses the physical symptoms to express feelings of discomfort. The diabetic child cheats with treatment, the hemophiliac tempts the danger of bleeding, and the child with cystic fibrosis refuses treatment. The use of an organic symptom that does not have objective reality (e.g., pain in the appendicular region after appendectomy) is frequent and testifies to the nonrecognition of an underlying message by the family of the child: the organ is removed but the psychic suffering persists.

The psychosomatic symptomatology of the child is the borderline of the physical and the psychical, of the inborn and the acquired, of the personal and the relational, and of the conscious and the unconscious. The approach to such a symptomatology needs a great deal of empathy, tact, and comprehension of the global context of the child, the family, and the society surrounding the child. Special educators are in an optimal situation to assist in the diagnosis of these disorders because of the consistent daily observations made by all teachers. School clinicians can refer to the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) for diagnostic criteria (American Psychiatric Association, 1994). If physical complaints over a period of time alert the teacher to suspect a somatic disorder, the school psychologist and parents should be made aware of the situation. Referrals to support professionals in the community should be on hand to assist the family in diagnosis and treatment.

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EMOTIONAL DISORDERS FAMILY COUNSELING PHYSICAL DISABILITIES SCHOOL PHOBIA

PSYCHOSURGERY

Psychosurgery is not an intervention that responds to a specific mental disorder. Instead, it is a neurosurgical procedure that was derived from observations made in animal aggression research (Fulton, 1949; Jacobsen, 1935) and applied to humans to control more violent psychiatric and neurological symptoms. Psychosurgical techniques were employed in the United States starting in the 1940s (Freeman & Watts, 1950). A variety of techniques that proceeded from gross frontal destruction by means of injections of alcohol into the frontal white matter (Kalinowsky, 1975) to sophisticated stereotaxic, electrically produced, ablative procedures (Kelly, Richardson, & Mitchell-Heggs, 1973) have been used. The location of lesions also has become more sophisticated. Initially, the goal of practitioners appeared to be to destroy enough anterior brain matter to create the desired effect, which was pacification of the patient. Contemporary techniques focus on greater localization of a lesion, hence avoiding large-scale brain destruction. Sites include parts of the limbic system, the anterior cingulum, and the posteromedial hypothalamus (Sano, Sekino, & Mayanagi, 1972).

The effectiveness of psychosurgery is straightforward. The issue is not one of vitiating the disorder but of limiting an individual's responsiveness to frightening and disturbing mental symptoms (Kalinowsky, 1975). Thus an individual is still likely to perceive threatening voices, but not react to them. Much like patients suffering the residuals of an accidental traumatic brain injury, leucotomized patients often were perceived by others as generally less spontaneous, more socially withdrawn, and more interpersonally distant. Psychosurgery has been used for

schizophrenic conditions, obsessive compulsive neuroses, and affective disorders. As may be expected, given the more general effects of the lesions, psychosurgery with affective disorders produces the least favorable outcome. With the prevalence of psychotropic medications, the use of psychosurgery for behavioral management has diminished significantly.

Recent applications of neurosurgical procedures have noted success in dealing with pain (Culliton, 1976), obsessive-compulsive disorder (Rappaport, 1992) and uncontrolled seizures (Spiers, Schomer, Blume, & Mesulam, 1985). The latter approach is the best example of what psychosurgery was intended to do; that is, to remove a brain area that is intimately involved in producing a disorder. The goal of surgical intervention with an uncontrolled epileptic disorder is to remove the brain tissue that is producing a seizure focus. Thus, the techniques used to identify that focus are as important as the surgical procedure itself. This last point draws the most clear distinction between earlier psychosurgical procedures and current methods. When performed to alleviate behavioral dysfunction, psychosurgery was essentially an approach to limit reactivity without affecting the underlying disorder; in contrast, when surgery is performed to alleviate uncontrolled seizures, the underlying cause is removed with changes in behavior following.

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NEUROPSYCHOLOGY

PSYCHOTHERAPY WITH INDIVIDUALS WITH DISABILITIES

Psychotherapy is defined as the application of psychological theories and principles to the treatment of problems of abnormal behavior, emotions, and thinking. The three major schools of psychotherapy are psychodynamic therapies, behavior therapies, and humanistic therapies.

The goal of psychodynamic, or insight, therapies is to help the client gain a sound understanding of his or her problems. Psychodynamic therapies are rooted in Freud's personality theory. Current behavioral and emotional problems are assumed to be the result of unconscious, intrapsychic conflicts and the unconscious mechanisms (i.e., defense mechanisms) employed to deal with them. It is a major goal of insight therapies to help bring this unconscious material into consciousness and thereby allow the client to exercise conscious, rational control over his or her actions. Hostile and sexual impulses as well as other motives or needs not acceptable to the individual's conscious sense of morality exert an influence on behavior through the unconscious. Techniques used in classical psychoanalysis to accomplish the goal of insight include free association, interpretation, and transference. Through free association, the client is encouraged to say whatever comes into his or her mind, no matter how trivial, embarrassing, or illogical. The analyst minimizes his or her influence on the client's verbal associations by responding minimally and nondirectively. At critical times during the free association, the analyst provides interpretations of the verbalizations in an attempt to help the client gain insight.

Transference refers to the expected tendency on the part of the client to experience the therapist-client relationship as similar to the parent-child relationship. Because the origin of the client's problems is assumed to reside in early parent-child interactions, transference permits the client to resolve problems from the past in the context of a new relationship. It is hoped that in the process, the client will discover insight into his or her behavior. When the patient sees a replaying of the old role of helpless child, he or she realizes the possibility of assuming adult roles in relationships with significant others rather than being driven by old, unresolved feelings experienced in the original parent-child relationship. Psychoanalysis is a complex and time-consuming process (50 minutes per day for months or years). Scientific evidence of its effectiveness is inadequate compared with that on more recent behavior therapies. Contemporary psychodynamic therapists retain an appreciation for unconscious influences on behavior but use more direct and focused techniques to help the client gain insight and exercise more rational control. The goal is to help clients find more realistic and effective ways to cope with their emotional needs. The client is helped to accept emotional

needs and to find ways to meet them within the demands of external reality.

Behavior therapies differ from psychodynamic therapies in several ways. First, the presenting problem is viewed as the appropriate focus for the treatment rather than assumed underlying causes in the client's intrapsychic life. Second, principles of learning derived from experimental psychology studies are applied to modifying maladaptive behaviors and cognitions. Maladaptive behaviors and cognitions are assumed to be learned, and they can be modified through the application of learning principles. Behavior therapists focus on the here and now rather than on the historical causes of a problem. Behavior therapy is a broad term encompassing a wide variety of therapeutic techniques. A basic tenet of behavior therapy is that different problems require different treatments. Furthermore, the selection of treatment procedures are based on empirical studies of the effectiveness of different procedures with similar problems.

Humanistic therapies also incorporate a wide range of techniques. Therapies with a humanistic orientation share a belief that each client is a unique individual striving for personal growth, or self-actualization. Carl Rogers' (1951) client-centered therapy is the best known example of the humanistic therapies. Key therapy techniques include the therapist's positive regard for the client and empathic, or reflective, listening. In reflective listening, the therapist is nondirective, serving as a mirror for the client, helping the client to sort out thoughts, attitudes, and feelings. It is assumed that the patient has the personal resources for solving his or her problem but needs the support of the therapist and an opportunity to see the problems more clearly.

The rationale for providing psychotherapy to pupils with disabilities is that persons with disabilities have the same or greater need for improved psychological functioning as nondisabled persons. Some pupils may not be able to focus their mental energies on learning because they are experiencing psychological stress and emotional confusion. When a child's emotional and behavioral problems interfere with his or her learning and social behavior, educational interventions need to be supplemented by interventions that focus on the interfering emotional and behavioral problems.

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ADJUSTMENT OF INDIVIDUALS WITH DISABILITIES FAMILY COUNSELING FAMILY THERAPY

PSYCHOTROPIC DRUGS

The majority of drugs classified as psychotropic affect brain processes and thus indirectly produce behavioral changes. Their chemicals work by either increasing or decreasing the availability of specific neurotransmitters. The major classifications include hypnotics, major tranquilizers (antipsychotic agents), minor tranquilizers (anxiety agents), stimulants, opiates, and psychedelics (hallucinogens). In most cases, these drugs increase or decrease activity level by producing effects on an individual's level of arousal. Potent psychedelic drugs add perceptual distortions to the more general effects.

Hypnotics are intended to produce drowsiness, enhance the onset of sleep, and maintain the sleep state (Katzung, 1982). These drugs produce a more profound depression on the central nervous system. They typically are referred to as barbiturates. Examples of this class of drugs are pentobarbital (Nembutal); secobarbital (Seconal); amobarbital (Amytal); and glutethimide (Doriden, Tuinal).

Barbiturates often are called "downers" because of their soporific action. Intoxication from barbiturates produces effects similar to those noted with alcohol. (For a complete review of barbiturate effects, see Blum, 1984, pp. 165-210.) Of particular concern in the use of barbiturates is the tendency to produce physical dependence over time. Additionally, unless withdrawal is performed in graded steps under medical supervision, there is the possibility of mortality during sudden withdrawal.

Barbiturates are the drugs most involved in suicides, including accidental suicides (automatisms). The latter refers to a state of confusion during which an individual who habitually uses sedatives is unsure whether a pill has been ingested and proceeds to take additional pills (Ray, 1972).

Tranquilizers are intended to diminish the discomfort associated with anxiety states. Stimulants are intended to combat fatigue and have been used with children to limit hyperactivity. Moderate doses of stimulants (amphetamines) have been prescribed as adjuncts to weight reduction programs. Examples of these drugs are amphetamines (Benzedrine), caffeine (coffee, cola), cocaine, dextroamphetamine (Dexedrine), methamphetamine (Methedrine), methylphenidate (Ritalin), and nicotine (tobacco).

Stimulants may be drunk (coffee), smoked (tobacco), inhaled (cocaine), ingested (amphetamines of various types), or injected (amphetamines). Though the following effects are seen most often in amphetamine abuse, they also are evident in relative degrees with the abuse of any of the stimulants. After use, the individual experiences a mild flush, which in the case of injectable amphetamines is compared to sexual orgasm. Feelings of euphoria, invulnerability, absence of boredom, and unlimited energy follow. Since abusers are likely to build up a tolerance for a specific drug, increased dosages or drug mixtures are used to create the "high." Continued abuse of a stimulant appears related both to

the wish to recreate the high and to the desire to avoid the fatigue and depression that occur during withdrawal.

Negative side effects of chronic abuse include malnutrition, insomnia, impulsiveness, defective reasoning, delusional thinking, hallucinations, and paranoia (Blum, 1984). Owing to the affective lability of abusers, the associated hyperactivity, and the significant paranoia, abuse of amphetamines tends to set up conditions in which violence may occur.

Opiates are intended to provide relief from pain and appear to mimic natural analgesics (endorphins). Historically, morphine was used not only to provide relief from extreme pain, but also for diarrhea, cough, anxiety, and insomnia (Katzung, 1982). Examples of drugs in this class include opium, morphine, codeine, heroin, dihydromorphine (Dilaudid), and meperidine (Demerol).

Of particular concern with this class of drug is that, along with tolerance for a specific drug, physical dependence also occurs. Though central nervous system depressants, opiates produce feelings of euphoria in persons who are experiencing either physical or emotional pain (Leavitt, 1982). Persons appear to start abusing opiates secondary to situational stress, unenlightened treatment for severe pain, and comradeship (Blum, 1984). Chronic abuse produces periods of nausea, vomiting, constipation, respiratory inefficiency, and limited pain awareness. The latter produces additional effects since abusers are unaware of physical distress (Leavitt). Mortality rates among heroine addicts under 30 are approximately 8 times that of nonaddicts (Leavitt).

Psychedelics have been used in various research programs, from perceptual research to brainwashing techniques (Leavitt, 1982). They have no consistent, specified therapeutic value. Some, like peyote, have been used in religious ceremonies because they bring on visions (hallucinations). It is this hallucinogenic property that makes these drugs attractive to abusers.

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**DRUG ABUSE
DRUG THERAPY
HALLUCINOGENS
TRANQUILIZERS**

PSYC SCAN

During the past decade, a vast amount of information, traditionally available only in print, has been placed into computer-readable and retrievable form. Consequently, psychologists, special educators, and researchers have at their disposal a wealth of knowledge that has been classified, summarized, and stored for easy, quick, inexpensive retrieval by computer. Psyc SCAN is a service of Psyc INFO, which is part of the Psychological Abstract Information Services Department of the American Psychological Association.

Psyc SCAN provides computer-readable information and publications in various areas that are important to professionals involved in special education: applied, clinical, and developmental psychology, learning/communication disorders (LD) and mental retardation (MR). On a quarterly basis, Psyc SCAN offers subscribers an effective and efficient way of keeping up to date on practice and research in their fields by providing citations and abstracts from recently published journal articles.

Abstracts in the applied, clinical, and developmental psychology sections of Psyc SCAN are derived from a set of core journals. When a publication is selected for one of these three areas, all relevant articles are summarized and listed by journal title along with complete citation, abstract, and index terms.

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**COMPUTER-ASSISTED INSTRUCTION
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PUBLIC LAW 108-446

See INDIVIDUALS WITH DISABILITIES EDUCATION IMPROVEMENT
ACT OF 2004 (IDEIA).

PUBLIC LAW 95-561

The Gifted and Talented Children's Education Act of 1978 was added, by PL 95-561, as Part A of Title IX of the Elementary and Secondary Education Act. The statute and its companion regulations describe gifted and talented children as individuals from birth through 18 years of age who require special educational services or activities because they possess demonstrated or potential abilities that give evidence of high performance capability in areas such as intellectual, creative, specific academic, or leadership ability, or in the performing and visual arts.

Financial assistance was provided under the Gifted and Talented Children's Education Program through two types of awards. Each state educational agency was eligible for a grant to plan, develop, operate, and improve programs for gifted and talented children. Eligible public or private organizations, agencies, or institutions also could compete for awards to conduct personnel training, model projects, information dissemination, or research.

On August 13, 1981, this funding program was consolidated into a block grant under Chapter 2 of the Education and Consolidation Improvement Act of 1981. States and localities may use the block grant funds, as appropriate, for continued services to gifted and talented children. Although recent years have seen the introduction of numerous bills designed to provide additional support for the education of gifted and talented students (e.g., the Gifted and Talented Students Education Act of 2001 and the Gifted and Talented Students Education Act of 2003), such measures have met with limited success, often folded into other education measures with reduced funding. Notable successors to PL 95-561 include the Javitz Gifted and Talented Students Education Act, which provided funding of demonstration grants and the National Research Center on the Gifted and Talented, and the No Child Left Behind Act of 2001, which authorized competitive grants to states to allow them to expand their capacity to meet the needs of gifted and talented children.

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PUERTO RICO, SPECIAL EDUCATION IN

Special education services in Puerto Rico are administered under the legislative provisions of IDEA, which are reflected in territorial law concerning the handicapped. Before IDEA and PL 94-142, there were few services. Since the legislation there has been greater consistency and continuity of services, improvement and expansion of personnel preparation, reduction of negative attitudes, and increasing movement of children toward the mainstream (Smith-Davis, Burke, & Noel, 1984).

Until a few years ago, the handicapped population in Puerto Rico was generally served in self-contained classes at the elementary level. Since 1979 programming has shifted to the mild and moderately handicapped, to mainstreaming, and to programs at intermediate and secondary levels. Prevocational and vocational centers for the handicapped have also been established (Smith-Davis et al., 1984).

Teacher certification policies in Puerto Rico are primarily noncategorical, with categorical certification reserved for those serving low-incidence populations. Smith-Davis et al. (1984) report that the University of Puerto Rico, which has had a special education program since 1965, and the Inter-American University, both offer undergraduate and graduate programs in special education. The University of the Sacred Heart and the Catholic University of Puerto Rico offer primarily undergraduate programs. In addition, two American universities, Fordham University-Puerto Rico Campus, and New York University's extension program offer graduate training at campuses on the island. All of these institutions offer adequate programs on learning disabilities, mental retardation, emotional disorders, and behavioral disorders. However, formal programs on the severely retarded and multiply handicapped are inadequate although some course work is available. The Department of Education carries on a vigorous in-service program at both local and regional levels and employs tuition assistance and other means to retrain and recertify practitioners.

Special education practices in Puerto Rico must be interpreted in light of the school system, which is highly centralized. It is organized into a central office responsible for all administrative and policy decisions, and six educational regions, each under a director appointed by the secretary of education (who is appointed by the governor at cabinet level). Each region is subdivided into districts run by superintendents. Within this structure, special education is largely centralized. It is directed by a special education

director and is divided into four units: administrative, curricular, academic, and vocational. Regional special education supervisors are appointed to each region. Thus there are six plus two supervisors, one each for prevocational and vocational programs (Brown, 1977).

Unlike the United States, where Puerto Ricans are a linguistic minority, in Puerto Rico they are the majority. Consequently, all services and instructional aids and materials for special education are in Spanish. It is important that U.S. special educators be aware that Puerto Rico, through the governor's office and other agencies, is ready to offer technical assistance in these areas to anyone who requests it (Cruz, 1979).

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- seldom evaluated in everyday use, thus resulting in inappropriate and ineffective use of the punishment procedure.
- Although punishment may involve the removal of a positive stimulus, it is most commonly applied by parents and teachers as the application of an aversive stimulus contingent on a behavior in order to reduce that behavior (Walker & Shea, 1984). A common example of this form would be physical or corporal punishment. Although the application of aversive stimuli has been documented as an effective procedure in reducing self-injurious behaviors (Dorsey et al., 1980; Sajwaj, Libet, & Agras, 1974) and severe aggressive behaviors toward others (Ludwig et al., 1969), its use in the form of physical punishment is not generally advocated by most professionals in the field of behavior management as the preferred means of reducing inappropriate behaviors. Besides legal, humane, and ethical concerns, there are a multitude of other disadvantages associated with the use of punishment:

In the long run, it could cause people to punish more often and to harm themselves and their victims by injuring them, if the punishment is physical, or by impairing social relationships and promoting aggression or escape, self-blame, imitative aggression, and other harmful side-effects. (Sulzer-Azaroff, & Mayer, 1986, p. 146)

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PUNISHMENT

Punishment, defined functionally, occurs when the presentation of an aversive consequence contingent on the emission of a behavior reduces the subsequent rate of that behavior. It is a commonly employed operant conditioning procedure. As Alberto and Troutman (1986) state, "Any stimulus can be labeled a punisher if its contingent application results in a reduction of the target behavior. A punisher, like a reinforcer, can be identified only by its effect on behavior—not on the nature of the consequent stimulus" (p. 245). Thus the mere application of an aversive stimulus (such as a spanking) or removal of a positive stimulus (such as a token or money) cannot be termed a punishment procedure unless a reductive effect on the target behavior occurs. Unfortunately, this reductive effect on behavior by a consequent stimulus is

APPLIED BEHAVIOR ANALYSIS AVERSIVE STIMULUS NEGATIVE PUNISHMENT PUNISHMENT, POSITIVE

PUNISHMENT, POSITIVE

Punishment is a procedure in which the presentation of a stimulus contingent on a behavior reduces the rate of emission of the behavior (Azrin & Holz, 1966). Punishment, like reinforcement, is defined by its effect on behavior. Numerous behavior change techniques used by psychologists and educators can be classified as punishment techniques (e.g., timeout, response cost, overcorrection, verbal reprimands, and electric shock; Axelrod & Apsche, 1983).

The use of adjectives such as "positive" and "negative" are most frequently associated with reinforcement techniques, but occasionally have been employed to further define punishment techniques. Behaviorists use these adjectives to describe the contingent presentation of a stimulus (positive) or the contingent removal of a stimulus (negative). These terms should *not* be interpreted as value judgments synonymous with "good" and "bad." Therefore, *positive punishment* is the contingent presentation of an aversive stimuli for a misbehavior or rule violation. Spanking a child for fighting with a peer is a classic example of positive punishment. Socially more acceptable examples of positive punishment include undertaking a noxious task such as cleaning a restroom (i.e., the aversive stimulus) contingent on messing it up. *Negative punishment* is the contingent removal of a positive stimulus. Common examples of negative punishment techniques include response cost or timeout.

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PUNISHMENT

PURDUE PERCEPTUAL-MOTOR SURVEY

The Purdue Perceptual-Motor Survey (PPMS; Roach & Kephart, 1966) was developed to enable qualitative observations of problem areas of perceptual-motor development. Subtests include walking board, jumping, identification of body parts, imitation of movements (following the examiner's arm movements), obstacle course, Kraus Weber (requiring the child to raise first the upper and then the lower torso while prone), angels in the snow (differentiation of arms and legs in various patterns), chalkboard (e.g., drawing simple to complex patterns), ocular pursuits (visual

tracking), and visual achievement forms (a paper and pencil copying task).

The theoretical and practical implications of the scale were described in Kephart (1971). The major assumptions that were controversial (Hammill, 1982) were that higher levels of learning are dependent on a motor base of achievement, and that perceptual-motor interventions are important for the remediation of academic deficits.

The norms were based on data from 200 children in grades one through four. Means and standard deviations were provided by grade. Test-retest reliability was .95 ($n = 30$, one-week interval). A validation study compared the performance of a sample of 97 nonachieving children with the normative sample (children with mental retardation were excluded). With one exception, items differentiated between groups.

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PERCEPTUAL AND MOTOR SKILLS

PUTAMEN

The putamen is the largest nucleus of the basal ganglia (caudate nucleus, putamen, globus pallidus, claustrum and amygdala) that function in background motor control via the extrapyramidal motor system (Carpenter & Sutin, 1983). The putamen also houses receptor sites for the dopamine containing neurons projecting from the substantia nigra. (The nigrostriatal system with the striatum is the putamen and caudate nucleus.) The putamen is located lateral to the thalamus and internal capsule but medial to the external capsule and inner aspect of the Sylvian fissure (see Figure 1 under CAT scan in this encyclopedia for depictions of its location). Since dopamine is an essential neurotransmitter for both normal motor and mental functioning, damage to the putamen may result in a wide spectrum of neurobehavioral changes. The prototype disorder of the basal ganglia that best exemplifies these motor and mental changes is Huntington's chorea. In Huntington's chorea there are specific motor deficits characterized by uncontrolled choreic movements as well as progressive dementia (Heilman &

Valenstein, 1985). The disruption of any part of the nigra-striatal system will affect dopamine production and will have significant neurobehavioral effects. These are discussed in the section on the substantia nigra. Recent research has also implicated a greater role of the basal ganglia in language function than had been suspected (Segalowitz, 1983).

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HUNTINGTON'S CHOREA SUBSTANTIA, NIGRA