

## **Issues Involved in Facilitated Communication and People with Down Syndrome**

**Chris Kliewer**

This article originally appeared in Vol. 3 No. 1 (Nov. 1994) of the Facilitated Communication Digest, [pp. 8-14].

In *Communication Unbound* (1993), Biklen describes his early encounters with people typing to communicate in Melbourne, Australia. He notes that when observing young people with Down syndrome typing, he assumed their conversational abilities would be more limited than those of other people whose communication was facilitated. This presumption proved false, and Biklen explains:

. . . the fact that I was ready to believe (people with Down syndrome) might be more limited than other people was testimony to my disability blinders, to my attributing mental retardation to the condition of Down syndrome, and to my retrieving its associated stereotypes. (p. 177)

Given the predominant assumption in disability research that Down syndrome nearly always includes mental retardation, many people may question why alternative communication systems would be thought appropriate for people with Down syndrome. Limited communicative abilities may be described as manifestations of cognitive deficiencies where people with Down syndrome are thought to speak at a level at which they are conceptually capable. For those with basically no understood speech, this would imply profound mental retardation.

### **The Construct of Mental Retardation Applied To People with Down Syndrome**

Attributions of intellectual deficiencies in all people with Down syndrome go back at least as far as Dr. J. Langdon Down's 1866 paper in which he created an ethnic system for the classification of people considered to have mental handicaps including what was described as congenital idiocy. In his ethnic hierarchy, Down identified a group described as Mongols (capitalized at that time). The term developed out of what Down considered to be physical features similar to those of people from Mongolia. He thought Mongolism was a manifestation of degeneracy caused by tuberculosis in the parents of children born with the disability.

Down considered all people categorized as Mongolian to be idiots, the most severe level of mental handicap. Similar assumptions continued through the decades, and have followed us into the 1990s. General agreement exists in the literature that the level of retardation is moderate to severe (MacMillan, 1982), though certain texts specific to Down syndrome now describe some individuals with mild mental retardation (Pueschel et al., 1987).

This equation, "Down syndrome = mental retardation," is apparent in introductory special education texts. Fishler and Koch (1991, p. 341) note: "Retarded mental development is found universally (in individuals with Down syndrome)." In the Smith & Luckasson (1992, p. 133) chapter introducing students to mental retardation, Down syndrome is included in a section on "Biological causes of mental retardation" as the most common genetic cause of moderate to severe mental retardation. Patton and Payne (1989, p. 112) note that for many the term mental retardation "conjures up the image of a Down's syndrome individual."

### **Breaking the Social Roles Prescribed For People with Down Syndrome**

Interestingly, the professional literature has described various individuals who do not follow the pattern prescribed for those with Down syndrome (Fredericks, 1987; Hopkins, 1983; Sarason & Doris, 1979; Butterfield, 1961; Blatt, 1987; Seagoe, 1964; Buck, 1955; Goode, 1992) Buck (1955), a psychologist, recounts his experience meeting a person with Down syndrome, Benjamin Bolt, who initially struck Buck as "another Mongoloid imbecile . . . (He was) patently a Mongoloid, and about as defective a Mongoloid as one could expect to find locomoting without active assistance" (p. 456).

Bolt's mannerism, though, challenged this initial assumption as he demonstrated refined social graces, and when tested, scored 111 on an intelligence test. Buck notes other researchers who questioned the stereotypes of people with Down syndrome, and posits: "This changing trend and the case of (Bolt) compel one to speculate that before too long it may well be demonstrated that Mongolism need not inevitably be accompanied by mental retardation, much less mental deficiency" (p. 481). (At the same time he was making this proclamation, Buck also was incarcerating Bolt into an institution where Bolt's abilities dwindled until his lonely death.)

Seagoe (1964) describes Paul Scott, an individual with Down syndrome who had learned to write at the age of 6 and had maintained a diary until near his death at the age forty-seven. Scott's teacher initially thought he was intellectually hopeless because "he spoke no intelligible words or sentences and asked no questions. He made incoherent sounds as he played, pulling out the drawers of her desk, taking the chalk and erasers from the blackboard and laughing with joy as he threw them at the ceiling" (p. 12). But through a process of "kinesthetic teaching" (p. 10), where Scott's motor ability was initially the focus, he learned to read and write.

With his wealthy father, Scott traveled around the world maintaining a diary in which he described his journeys. An example from a visit to the Soviet Union stated:

We rode on the new underground called the metro. We saw Cossack soldiers in long overcoats to their ankles . . . The patriarch of the Greek Catholic Church is a prisoner of the Soviet, picking cotton on a collective farm in Asiatic Russia. The "Hidden Church" we attended were all aged people. The hymn books were threadbare. Secretly, 30,000 Bibles were printed and distributed in the last several years. (p. 102)

Seagoe never questioned the label of mental retardation for Scott despite his obvious literary abilities. She did, however, challenge others to begin looking at reading and writing as an effective tool in working with individuals with intellectual deficits.

Blatt (1987) recounts his initial introduction to Seagoe in 1962. She was unable to get a publisher to believe that the diary was the work of an individual with Down syndrome. Blatt initially doubted Seagoe's claim as well, but two decades later he pondered how he could have doubted the authenticity of the diary, and concluded "the answer to that question perhaps lies in the deeply embedded hopelessness associated with virtually everything connected with mental retardation" (Blatt, 1987, p. 102).

Carter's (1985) description of her son's emergent literacy skills demonstrated through his reading of books at the age of two sits awkwardly alongside her lament that he has the mind of a nine-month old. Carter explains that "despite his retardation, (Darwin's) favorite toys are books and his favorite activity is reading" (p. 23). She writes that, like many retarded children, two-year-old Darwin has a short attention span, but has built up his ability to read for periods longer than 30 minutes. His reading began at four months when he showed an interest in short books, and by the age of one he was "fascinated with literature" (p. 25). Such behavior, attention, and interest does not conjure up traditional images of mental retardation. In fact, one might be more inclined towards the label talented and gifted if a label is necessary at all.

Some people may express the belief that these examples are in the literature precisely because they are anomalies, strange aberrations that make for good human interest reading, but with little meaning for the general population. However, Doug Biklen (personal communication) noted that people with Down syndrome appear to get more competent every ten years. His point is that the associated stereotypes surrounding the idea of Down syndrome continue to evolve. Where once Dr. Benjamin Spock's influential book *Baby and Child Care* (1946) suggested that babies born mongoloid should immediately be institutionalized based on the premise that "If (the infant) merely exists at a level that is hardly human, it is much better for the other children and the parents to have him cared for elsewhere" (p. 478), current doctrine supports early intervention efforts (Mahoney & Snow, 1983), schooling with some degree of focus on academics (Graffi & Minnes, 1988), and job placement of people with Down syndrome (Karan, Knight, & Pauls, 1987). Some current researchers now question the assumption that we can know the upper limit of intelligence in any person with Down syndrome (Wishart, 1987).

Interestingly, in terms of educating children with Down syndrome, there is widespread acceptance of the importance of providing reading and other literacy opportunities beginning in the preschool. Johansson (1993) describes dramatic reading results in a group of children with Down syndrome provided with language stimulation in their preschool programs that continued

into their elementary schooling compared to children not given the same extensive training and teaching.

In a review of the literature on the literacy abilities of preschool children with Down syndrome, Buckley (1985) notes that numerous studies demonstrate "Down's children are showing reading skills as good as or more advanced than would be expected even for normal children (of the same chronological age)" (p. 325). She considers the idea that "mastering a written language is in some way easier than mastering a spoken language for Down's children" (p. 322), and suggests that, unlike the nondisabled child, who learns to read as a second language, the child with Down syndrome learns to read as if it were a first language. Paradoxically, Buckley (1985) points out without criticism that, despite demonstrated reading ability, the preschool children involved in the numerous studies cited are mentally retarded based on IQ scores.

Similar contradictions occur in a recent popular book, *Count Us In: Growing Up With Down Syndrome* (Kingsley & Levitz, 1994), which describes the life of two young men as told by them in interviews transcribed and organized by their parents. In the introduction, the mothers of the two men refer to the unusual phrasing and word choices throughout the book explaining that they chose not to alter the syntax of the interviews. The mothers write:

"The boys have a developmental disability, after all, and we have no desire to hide or camouflage that fact. Rather, we wanted readers to have a true-to-life sense of their... intelligence." (Kingsley & Levitz, 1994, p. 9)

This reference to the mens' "developmental disability" in relation to their intelligence conjures up stereotypes in the audience around the construct of "mental retardation" without the use of the stigmatizing label.

However, in describing their high school experience, both Kingsley and Levitz point out that they are receiving regular Regent's diplomas from a regular high school academic program. The grades reported in the book are average to above average in subjects such as history and algebra. Levitz notes that U.S. Government class and Economics class were "easy to understand because I keep up in the world" (p. 53). When the two men do describe academic difficulties they are always in relation to the pace at which the two physically can work. In one example, Kingsley is asked if he would rather not have Down syndrome. He responds that due to many "disasters" he wished the world would change for him. He is asked what type of disasters, and he responds:

Well, when I'm in school, I write slowly and when I write fast my writing comes sloppy and people don't understand my writing. . . . When I'm slow I keep behind . . . about my work. . . .If the bell rings from there, what can I do? I just have to do it at home, and I hate that. (p. 38-39)

Jason tells his mother at one point, "I want them to stop so I can catch up. I don't want the teachers to go faster than I am" (p. 39).

The description provided by Kingsley and Levitz (1994) suggests that Down syndrome may not be associated with difficulties in conceptualizing the world in ways similar to non-disabled people, but rather the handicap may be related to the ability to act and perform in a world created by and for people who do not have the same motor issues as do people with Down syndrome.

### **Influences On The Performance Ability Of People With Down Syndrome**

In the research literature on performance development of people with Down syndrome, two areas of delay are universally considered in excess of what mental age would predict. These include language development (Pruess et al., 1987) and motor development (Fewell, 1991).

Florez (1992) notes: "There is an asynchrony in language production relative to understanding and other cognitive skills" (p. 167). Miller (1988) states that "This particular characteristic... is a great puzzle to scientists working in the area of child development, language development, and development of intelligence" (p. 120).

One way researchers have approached the puzzle is by recognizing and developing understanding of the connection between speech production and motor sequencing (Miller, 1988; Pruess et al., 1987; Mervis & Cardoso-Martins, 1984; Dodd, 1975). Traditionally, speech production has been described as a product of language ability which is associated with certain developmental levels. It has been suggested that people with Down syndrome cannot conceptually or physically move from Piagetian sensorimotor stage 5 to stage 6 (Gibson, 1978, p.33), a move thought necessary for symbolic language development (Zigler & Finn-Stevenson, 1987). However, other researchers have found that children with Down syndrome pass easily into Piaget's stage 6. Rather, they are less likely to use stage 6 skills spontaneously. For instance, the children are less likely to spontaneously utter words known to be part of their language repertoire (Mervis & Cardoso-Martins, 1984). Kangas and Lloyd (1988) point out that many people with Down syndrome show quite variable scores on developmental scales which "casts doubt on the practice of assigning a single stage description of development. . . . sensorimotor stage 5 or 6 has little meaning" (p.214).

Language production requires highly complex motor skills (Dodd, 1975; Elliott, 1985; Miller, 1988; Frith & Frith, 1974). Contradicting the idea that differences in speech are evidence of cognitive limitations, Dodd (1975) explains: "The spontaneous articulatory disorder of the Down syndrome children must be due to a disability in the motor programming of the speech act" (p. 306). This translates into difficulties in "moving the speech system, particularly in coordinating the rapid movements of the tongue, lips, jaw, and palate, with voicing and respiration" (Miller, 1988, p. 121).

The general hypotonic state of the musculature is partially implicated in the differences people with Down syndrome have in complex movement. Nihman-Reed and Sleight (1988) explain certain effects of this low muscle tone: "The child with Down syndrome prefers movement patterns that require a minimal expenditure of energy. This is a reflection of the effort required rather than a predisposition to be lazy" (p. 96). Mundy et al. (1988) explain the effects of this on speech production:

Research on neuromotor hypotonia suggest that Down syndrome is associated with chronically low levels of arousal . . . If this is so, then Down's children may display a passive style of interaction with their environment. Lower arousal and passive style of behavior may also contribute to observed deficits in motivation. Thus, a disturbance in arousal may be a superordinate factor that mediates the disturbance of motivational and communication behaviors observed in Down syndrome children. [This] suggests an examination of the interplay between arousal, motivation, and communication development, and may be an important approach to understanding the developmental deficits associated with Down syndrome. (p. 248)

Because spoken language is such an extremely difficult communication modality for many individuals with Down syndrome (Kumin, 1986), alternative systems of expression have been explored. Initially, pointing and gesturing may be extremely difficult requiring direct training. In experiments testing the pointing ability of people with Down syndrome compared to that of nondisabled people, people with Down syndrome are slower and more variable in their gestures while the people without Down syndrome are quicker and more consistent (Elliot, 1985; Frith & Frith, 1974).

These movement differences become more pronounced when the task demand involves a sequence of movements (Elliot, Gray & Weeks, 1991). For instance, people with Down syndrome had an extremely difficult time alternating tapping between two plates positioned directly in front of them. Anwar and Hermelin (1979) found that in a pointing task, children with Down syndrome had tremendous difficulty changing the angle of their pointing from straight ahead to slightly off-center. Repeated movements that require varying angles of gesture, such as typing, are physically challenging.

Several researchers have noted difficulty on the part of people with Down syndrome to use sensory information to execute properly timed motor commands (Cole, Abbs & Turner, 1989; Henderson, Morris & Frith, 1981; Henderson, Illingsworth & Allen, 1991), important in adapting behavior to new environments. Henderson, Morris and Frith (1981) found two areas of extreme difficulty for movement in people with Down syndrome, both having to do with timing: when movement had to be completed within a given time criterion, and when movement sequences had to be planned to relate to an external event -- for instance, the catching of a ball. Henderson, Illingsworth and Allen (1991) admit, "DS individuals display (reaction times) which are in excess of that predictable from their intellectual ability alone" (p. 239).

Most of these studies of motor issues take place in experimental environments that remove behavior from the natural setting. It is suggested that variables can then be controlled. However, the meaning of movement differences in the life of a person may not be apparent when the context is contrived. These studies assume intellectual incompetence, and then tack issues of motor disturbance on as a tangent further differentiating the person from the norm. Rarely is it suggested that difficulties with sequenced behavior has nothing inherently to do with cognitive limitations, and that ideas like the IQ test are built entirely around one's ability to perform.

Interestingly, constructs such as mental age and IQ positively correlate with tests of physical and movement ability (Henderson, Morris & Ray, 1981). Henderson et al. (1981) postulate that this correlation means people with Down syndrome "of higher intelligence, may, therefore, be able to evolve strategies that minimize the effect of a physical disability . . ." (p. 423). This is an interesting interpretation of evidence that might lead others to conclude that the degree of motor difference may influence scores on tests supposedly measuring the ability to think.

In presenting this idea to a small group of special education administrators, one man called out, "So what? What's the difference, in the end, of either being mentally retarded or not being able to perform? Aren't you playing with words, manipulating ideas?" Stephen Hawking would have something to say about that question. Certainly, people struggling to develop effective communication strategies for people with Down syndrome would also have a response to this administrator's point.

### **AAC and People with Down Syndrome**

Rosemary Crossley (personal communication) pointed out that because of assumptions about mental retardation, people with Down syndrome are often not provided with alternative communication strategies if their speech is limited but does include a few understandable words. That speech is thought to be "good enough" for the purposes of people so mentally retarded. Those whose speech is even more limited may be given extremely simple picture pointing strategies, and the difficulty people have in using them confirms ideas of an intellectual ineptitude. We may not stop to question other potential problems in using the picture boards such as the pictures provided may not represent what the person wants to say, or the person's ability to physically access the board may not be efficient.

Alternative communication techniques have proven effective for people with Down syndrome when issues of motor differences have been considered (Pecyna, 1988). In one case study, a four-year-old child was trained to use Rebus symbols to ask for things at snack. Initially, the child had difficulty reaching out to touch particular symbols. Training involved teachers interpreting the child's behavior to figure out what the child was attempting to indicate, then physically guiding the child's hand to the correct symbol. Over the course of several days, the child developed an ability to initiate an accurate and reliable gesture (Pecyna, 1988). Pecyna (1988) concluded that

the use of Rebus symbols assisted in the development of speech because the child began to speak the symbols (paired with words) that she was pointing to.

Gestural types of sign language by and with children with Down syndrome has consistently added to expressive abilities on the part of the children who have had difficulty with speech production (Jago, Jago, & Hart, 1984; Kouri, 1989; Wolf & McAlonic, 1977; Roch, 1978; Simons-Derr, 1983). Simons-Derr (1983) noted that within four months beginning signing with her 27 month old child, his manual vocabulary was more than triple his spoken vocabulary, and that quickly his spoken language was beginning to develop relative to presigning. Hand movements developed with physical, hand-over-hand assistance. Kouri (1989), describing the use of sign language with children with Down syndrome notes: "Signing does not interfere with spoken language, but rather seems to facilitate its onset and development" (p. 50). Researchers describe children who speak very poorly developing quickly the ability to say particular words that they first learned to sign.

Use of computers and lexigram systems have also proven affective as communication modalities for children with Down syndrome (Meyers, 1986; Abrahamsen, Ronski, & Sevak, 1989). Meyers (1986) notes: "I started using computers after five frustrating years of working with children who had very little expressive language due to . . . Down syndrome" (p.20). She started working with toddlers exposing them to the functional uses of the computer as a system for requesting and labeling items. Graphics on the screen could be touched to request real- life objects. When the picture was touched, the computer, using a voice synthesizer, spoke the word. Toddlers with Down syndrome, over time, developed the ability to initiate movement and reach towards the screen. Through initial structured exposure to one-word options combined with general considerations for the development of movement control, the young children developed an ability to use the computer in a communicative fashion building up to reading phrases. As the children aged, she started a literacy program in which they wrote books on topics of their own choosing. Initially, the children dictated sentences that were transcribed into grammatically appropriate form on paper.

From this beginning point "Children quickly learn to write in grammatical, multiword sentences. This work shows that some children with language disabilities can learn to write grammatical sentences before they can speak them" (p. 22). One 13-year-old girl with Down syndrome wrote a book about God: "He's going to like this. I can hear God talking in my head. I like his finest whispers" (p. 22).

### **Facilitated Communication and People with Down Syndrome**

Decades of research provide a grounding for the understanding of the use of facilitated communication training with people with Down syndrome. The evidence which supports the contention that inefficient or ineffective communication is the result of conceptual limitations is found in research which takes the retardation as a "given." If the research literature is examined

without such a presupposition, the data more strongly suggests that the performance of people with Down syndrome reflects difficulties in initiating then accurately maintaining movements, both simple and complex.

Because speech requires complicated, sequenced motor patterns, gestural systems of communication have proven effective for people with Down syndrome. Hand movements are much less complex motions than those required to produce speech. However, they may still be difficult movements to make. This is especially true when the movement must be repeated over and over with slight variations in the target all the while maintaining concentration on the final product such as a typed phrase. All of those individuals described as succeeding with symbols and print have done so only when considerations for sequenced movement difficulties have been taken into account.

To facilitate is to make easier. The physical support provided people with Down syndrome described in the literature on facilitated communication training (Crossley, 1994) allows for the efficient and affective accessing of communication devices. Issues involved in movement initiation, kinesthesia, hypotonia, and sensory perceptions all are accounted for in the support provided for typing or gesturing. As skills in repeated movements involved in typing original thoughts or gesturing to desired symbols develops, support can be reduced eliminating certain elements of the controversy surrounding the use of typing for expression. Some people with Down syndrome are typing to express themselves at sophisticated levels, and are now doing so with no facilitated support (Crossley, 1994).

## References

- Abrahamsen, A.A., Ronski, M.A., & Sevak, R.A. (1989). Concomitants of success in acquiring an augmentative communication system: changes in attention, communication, and sociability. *American Journal on Mental Retardation*, 93(5), 475-496.
- Anwar, F., & Hermelin, B. (1979). Kinaesthetic movement after-effects in children with Down's syndrome. *Journal of Mental Deficiency Research*, 23, 287-297.
- Biklen, D. (1993). *Communication Unbound: How Facilitated Communication Is Challenging Traditional Views Of Autism, And Ability/Disability*. New York: Teachers College Press.
- Blatt, B. (1987). *The Conquest of Mental Retardation*. Austin, TX: Pro-Ed.
- Buck, J.N. (1955). The sage: an unusual mongoloid. In A. Burton & R. Harris (Eds.) *Clinical Studies Of Personality*, vol. III. New York: Harper and Row.
- Buckley, S. (1985). Attaining basic educational skills: Reading, writing and number. In D. Lane & B. Stratford (Eds.) *Current Approaches To Down's Syndrome*. (pp. 315-343). New York: Praeger.

- Butterfield, E.C. (1961). A provocative case of over-achievement by a mongoloid. *American Journal on Mental Deficiency*, 66, 444-448.
- Carter, S. (1985). Darwin's world of books. *The Exceptional Parent*, 15(3), 23-25.
- Cole, K.J., Abbs, J.H., & Turner, G.S. (1988). Deficits in the production of grip forces in Down syndrome. *Developmental Medicine and Child Neurology*, 30, 752-758.
- Crossley, R. (1994). *Facilitated Communication Training*. New York: Teachers College Press.
- Dodd, B. (1975). Recognition and reproduction of words by Down syndrome and non-Down syndrome retarded children. *American Journal on Mental Deficiency*, 80(3), 306-311.
- Elliott, D. (1985). Manual asymmetries in the performance of sequential movement by adolescents and adults with Down syndrome. *American Journal Of Mental Deficiency*, 90(1), 90-97.
- Elliot, D., Gray, S., & Weeks, D.J. (1991). Verbal cuing and motor skills acquisition for adults with Down syndrome. *Adapted Physical Activity Quarterly*, 8, 210-220.
- Fewell, R.R. (1991). Effective early intervention: results from the model preschool program for children with Down syndrome and other developmental delays. *Topics In Early Childhood Special Education*, 11(1), 56-68.
- Fishler, K., & Koch, R. (1991). Mental development in Down syndrome mosaicism. *American Journal on Mental Retardation*, 96(3), 345-351.
- Florez, J. (1992). Neurological abnormalities. In S.M. Pueschel & J.K. Pueschel (Eds.), *Biomedical Concerns In Persons With Down Syndrome* (pp.159-173), Baltimore: Paul H. Brookes.
- Fredericks, B. (1987). Tim becomes an eagle scout. *The Exceptional Parent*, 17(2), 22-23.
- Frith, U., & Frith, C.D. (1974). Specific motor disabilities in Down's syndrome. *Journal of Child Psychology and Psychiatry*, 15, 293-301.
- Gibson, D. (1978). *Down syndrome: The Psychology Of Mongolism*. New York: Cambridge University Press.
- Goode, D.A. (1992). Who is Bobby?: Ideology and method in the discovery of a Down syndrome person's competence. In P.M. Ferguson, D.L. Ferguson & S.J. Taylor (Eds.) *Interpreting Disability: A Qualitative Reader* (pp.197-212). New York: Teachers College Press.

- Graffi, S., & Minnes, P.M. (1988). Attitudes of primary school children toward the physical appearance and labels of associated with Down's syndrome. *American Journal On Mental Retardation*, 93(1), 28-35.
- Henderson, S.E., Illingsworth, S.M., & Allen, J. (1991). Prolongation of simple manual and vocal reaction times in Down syndrome. *Adapted Physical Activity Quarterly*, 8, 234-241.
- Henderson, S.E., Morris, J., & Frith, U. (1981). The motor deficit in Down's syndrome children: A problem of timing? *Journal of Child Psychology and Psychiatry*, 22(3), 233-245.
- Henderson, S.E., Morris, J., & Ray, S. (1981). Performance of Down syndrome and other retarded children on the Cratty Gross-Motor Test. *American Journal of Mental Deficiency*, 85(4), 416-424.
- Hopkins, G.A. (1983). If you see a Down syndrome individual, don't jump to conclusions. *Journal For Special Educators*, 19(3), 51-58.
- Jago, J.L., Jago, A.G., & Hart, M. (1984). An evaluation of the total communication approach for teaching language skills to developmentally delayed preschool children. *Education and Training of the Mentally Retarded*, 19(3), 175-182.
- Johansson, I. (1993). Teaching prereading skills to disabled children. *Journal of Intellectual Disability Research*, 37(4), 413-417.
- Kangas, K., & Lloyd, L. (1988). Early cognitive skills as prerequisites to augmentative and alternative communication: What are we waiting for? *Alternative and Augmentative Communication*, 4, 211-221.
- Karan, O.C., Knight, C.B., & Pauls, D. (1987). Vocational opportunities: An exploration of the issues. In S. M. Pueschel, C. Tingey, J.E. Rynders, A. Crocker, & D. Crutcher (Eds.), *New Perspectives On Down Syndrome*. (pp. 355-377). Baltimore: Paul H. Brookes.
- Kingsley, J., & Levitz, M. (1994). *Count Us In: Growing Up With Down Syndrome*. San Diego: Harcourt Brace.
- Kouri, T. (1989). How manual sign acquisition relates to the development of spoken language: a case study. *Language, Speech, and Hearing Services In Schools*, 20, 50-62.
- Kumin, L. (1986). A survey of speech and language services for Down syndrome: state of the art. *Applied Research In Mental Retardation*, 7(4), 491-499.
- MacMillan, D.L. (1982). *Mental Retardation In School and Society* 2nd edition. Boston: Little, Brown.

- Mahoney, G.J., & Snow, K. (1983). The relationship of sensorimotor functioning to children's response to early language training. *Mental Retardation*, 21(6), 248-254.
- Meyers, L.F. (1986). Teaching language. *The Exceptional Parent*, 16(7), 20-23.
- Mervis, C.B., & Cordoso-Martins, C. (1984). Transition from sensorimotor stage 5 to stage 6 by Down syndrome children: A response to Gibson. *American Journal On Mental Deficiency*, 89(1), 99-102.
- Miller, J.F. (1988). Facilitating speech and language development. In C. Tingey (Ed.) *Down Syndrome: A Resource Hand- book*. Boston: College-Hill.
- Mundy, P., Sigman, M., Kasari, C. & Yirmiya, N. (1988). Nonverbal communication skills in Down syndrome children. *Child Development*, 59(1), 235-249.
- Nihman-Reed, C., & Sleight, D.H. (1988). Gross motor development in young children with Down syndrome. In C. Tingey (Ed.) *Down Syndrome: A Resource Handbook*. Boston: College-Hill.
- Patton, J.M., & Payne, J.S. (1989) Mild mental retardation. In N.G. Haring (Ed.) *Exceptional Children and Youth*, 3rd Ed. Columbus, OH: Charles E. Merrill.
- Pecyna, P.M. (1988). Rebus symbol communication training with a severely handicapped preschool child: a case study. *Language, Speech, and Hearing Services In Schools*, 19, 128-14.
- Pruess, J.B., Vadasy, P.F., & Fewell, R.R. (1987). Language Development in children with Down syndrome: An overview of recent research. *Education and Training in Mental Retardation*, 22(1), 44-55.
- Pueschel, S.M., Gallagher, P.L., Zartler, A.S., & Pezzullo, J.C. (1987). Cognitive and learning processes in children with Down syndrome. *Research in Developmental Disabilities*, 8(1), 21-37.
- Roch, R. (1978). Gestural facilitation of expressive language in moderately/severely retarded preschoolers. *Mental Retardation*, 16, 113-117.
- Sarason, S.B., & Doris, J. (1979). *Educational Handicap, Public Policy, and Social History: A Broadened Perspective On Mental Retardation*. New York: The Free Press.
- Seago, M.V. (1964). *Yesterday Was Tuesday, All Day and All Night: The Story of a Unique Education*. Boston: Little Brown.
- Simons-Derr, J.A. (1983). Signing vs. silence. *The Exceptional Parent*, 13(6), 49-52.

Smith, D.D., & Luckason, R. (1992) *Introduction to Special Education: Teaching In An Age Of Challenge*. Boston: Allyn & Bacon.

Spock, B. (1946). *The Pocket Book Of Baby And Child Care*. New York: Pocket Books.

Wishart, J.G. (1987). Performance of young non-retarded children and children with Down syndrome on Piagetian infant search tasks. *American Journal On Mental Deficiency*, 92(2), 169-177.

Wolf, J.M., & McAlonic, M.L. (1977). A multimodality language program for retarded preschoolers. *Education and Training for the Mentally Retarded*, 12, 197-202.

Zigler, E.F., & Finn-Stevenson, M. (1987). *Children: Development and Social Issues*. Lexington, MA: D.C. Heath & Co.