

■ A Review of Early Intervention Programs and Effectiveness Research for Environmentally Disadvantaged Children

■ Examen des programmes d'intervention précoce et de la recherche sur l'efficacité pour les enfants défavorisés du point de vue de l'environnement

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Abstract

Widespread awareness of the lasting impact of children's experiences in the first six years of life has increased interest in early intervention programs for children at risk for poor life outcomes. This article provides an overview of programs and effectiveness research in early intervention for children at risk due to being environmentally disadvantaged. A summary of the effects, program features, and participant characteristics that influence effectiveness is included. Finally, the potential contribution of the speech-language pathologist to prevention and early intervention for the environmentally disadvantaged child is discussed.

Abrégé

Les efforts généralisés de sensibilisation sur les effets durables du vécu des enfants au cours des six premières années de vie ont suscité l'intérêt pour les programmes d'intervention précoce auprès des enfants qui risquent de rejoindre les rangs des classes défavorisées. Le présent article trace un portrait des programmes et de la recherche sur l'efficacité de l'intervention précoce pour les enfants qui sont à risque parce qu'ils sont défavorisés du point de vue de l'environnement. Il présente aussi un résumé des effets, des points saillants des programmes et des caractéristiques des participants qui influent sur l'efficacité. Enfin, il aborde la contribution potentielle que peuvent apporter les orthophonistes pour la prévention et l'intervention précoce auprès des enfants défavorisés du point de vue de l'environnement.

Key words: early, intervention, disadvantaged, children, effectiveness, language, cognition, achievement, literacy, prevention

North America has a long history of social programs designed to help disadvantaged members of society attain a better life (Vinovskis, 1996). Early intervention programs for children at risk were catalysed in the United States in the 1960s by the Kennedy administration's Great Society and the Johnson administration's War on Poverty. Social and educational programs were designed to prevent or minimize the negative consequences of environmentally based disadvantage. The underlying assumption appears to be that the course of these children's lives can be influenced by interventions that enhance development and strengthen families (St. Pierre & Layzer, 1998).

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The literature on the effectiveness of early intervention programs for environmentally at risk children and their families is voluminous and fraught with methodological and interpretive controversy. The weight of the evidence, however, suggests that many of these programs have produced significant short and medium-to-long term positive outcomes for these children, their families, and society (Barnes, Goodson, & Layzer, 1996; Bryant & Maxwell, 1997; Farran, 1990; McCain & Mustard, 1999; Wasik & Karweit, 1994; Yoshikawa, 1994). Documented effectiveness and legislative mandates that followed have furthered the proliferation of programs for at risk children funded by governments at all levels and by private foundations and industry.

The principles of early intervention have been applied to different populations of children considered to be vulnerable to poor life outcomes socially, educationally, and vocationally. Early intervention programs are typically offered to those infants and children with: (a) environmental risk, (b) increased biological risk, or (c) established developmental delays, deviations, or disabilities (Parry, 1992). The present paper will focus on programs that are intended to support and assist families who are unable to provide adequate early stimulation and learning opportunities for young children due to environmental stressors, the most prominent being economic stress (Ramey & Ramey, 1998).

Early Intervention Programs for the Environmentally Disadvantaged

Early intervention programs have evolved over time to include important features (Guralnick, 1997). The features of community and family base have resulted in programs being offered in the communities where children at risk and their families live with program offerings fitted to the requirements and desires of the families being served. Services for families that were previously fragmented are coordinated with qualified personnel from multiple disciplines being available within programs and easy transition to additional supportive services. Guralnick (1988, 1993) has asserted that "first-generation" research conducted prior to 1986 answered the overall effectiveness question in the affirmative. "Second-generation" research is intended to inform practice by determining which program features (e.g., curriculum approaches, intensity, timing) and child and family characteristics (e.g., type of risk factors, family stressors) relate to outcomes, how these may interact, and to identify the mediating factors. Specificity of the relationships between goals/outcomes of the intervention and program features, as well as child and family characteristics, should lead to efficient programs with predictable

outcomes that help illuminate how the intervention accomplished what it did.

Although there is no one concept of early intervention for children at risk, the goals can be broadly defined as promotion of healthy development to maximize potential, prevention of secondary difficulties that can be consequences of risk factors, and support of families to meet the needs of their children (Moore, 1990). Vast arrays of early intervention programs for populations at environmental-risk have been implemented and several reviews of effectiveness are available (Barnett, 1995; Cohen & Radford, 1999; Farran, 1990; Guralnick, 1997; McCain & Mustard, 1999; Parry, 1992; Olds & Kintzman, 1993; Wasik & Karweit, 1994; Yoshikawa, 1994). Some programs are centre-based, home-based, or both, and some are child-focused, parent-focused, or both. The range of service may be narrow (e.g., primarily preschool education or primarily parent education) or broad (e.g., include health and nutritional services, provision of basic family necessities, etc.). Programs also vary in regard to when services begin, how long they continue, and how much service is available.

The effects of programs are also measured in different ways. Standardized measures are typically employed to assess various developmental domains in the children. The most common measurement tools include tests of intelligence and developmental milestone acquisition administered during, immediately after, and in follow-up as the children enter school. In addition, medium and long-term measures of educational achievement and social and vocational success are utilized as the children progress through school and into adulthood. The type of information collected as outcomes reflect the time at which programs were initiated and the view of early intervention as compensatory education for children who were entering school without requisite learning skills. Researchers have been preoccupied with IQ tests as an outcome measure of cognitive skills that support learning. The expectation for prevention of failure and promotion of success in life for disadvantaged children is evident in outcome measures of global educational and social-behavioural adaptation. Because parent training programs are intended to increase parenting capacity which should indirectly influence child development, the effects of parent training programs typically include measures of parental knowledge, attitudes, and behaviour, as well as measures of the home environment and developmental measures of the children.

Selected Individual Programs and Effectiveness Research

A sample of programs was chosen for discussion below. Selected programs represent a range of approaches for intervention. The best known, well developed, and researched programs whose effectiveness results have influenced the evolution of early intervention are described. Other less extensively studied programs that support or add information about the effects of early intervention are included. As with most applied research involving human subjects in the field, subject selection, heterogeneity of samples, lack of control groups or random assignment to treatment or no-treatment groups, attrition, lack of fidelity of treatment, and limited measurement tools are methodological difficulties that complicate interpretation of early intervention results. Thus, methodological issues and limitations are addressed in the program effects reviewed.

Primarily Centre-based Programs

Head Start

Head Start programs in the United States are the most widely available and well-known early childhood programs for economically disadvantaged children. The programs began in 1965 as early childhood classrooms and over time have added health, parent, and family support services. Children enter the programs at three or four years of age. Head Start has evolved into a constellation of programs with diverse curriculum models and adjunct support programs. Few controlled studies that compare Head Start programs to other programs or no programs are available or are difficult to interpret due to weak research designs, small numbers of subjects, and changes in protocols over the years. These studies are, however, suggestive of positive impact on cognitive and school functioning.

One study that reanalysed the testing results of 900 children from the Head Start Longitudinal Study, 1969-70, found significant one year gains for some measures of ability compared to similar children who attended other preschools or no preschools (Lee, Brooks-Gunn, & Schnur, 1988). Positive benefits of increased IQ and early school achievement favoured only African American children. The enduring effects at Grade 1 for African American children were primarily in relation to children with no preschool, suggesting that the effect may have been a preschool effect rather than a Head Start effect (Lee, Brooks-Gunn, Schnur, Liaw, 1990). It has been suggested that low quality Head Start Programs may be responsible for the disappearance of positive effects within the first one to two years of school (Bryant, Burchinal, Lau, & Sparling, 1994), which has led to new funds for quality enhancement of Head Start.

Improvement of the language and literacy focus in Head Start programs also has been suggested (Bryant et al., 1994). Positive effects have been shown in one recent study of a literacy intervention program added to the regular head start program (Whitehurst, Epstein, Payne, Crone, & Fischel, 1994). Classrooms of 4-year-olds attending Head Start were randomly assigned to receive either the add-on literacy program or the regular curriculum over the 1992-1993 school year. The children in the intervention group were compared to control children receiving the standard curriculum pre- and post-intervention. The literacy program included interactive book reading at home and in the classroom, as well as a classroom-based sound and letter awareness program. Minimal time and effort were required for training teachers and parents to implement the program. A child who participated maximally over the course of a school year would have invested about 42 hours of time in the classroom program. Outcomes included tests of receptive and expressive vocabulary, expressive language, and development of early literacy skills. The effects on language were large but only for those children whose primary caregivers had been actively involved in the at-home component of the program. The classroom-based interactive reading did not, by itself, generate increases in children's language skills. The intervention group of children compared to the controls demonstrated significantly better recognition of first letter and sound in words, however, children were not brought up to the typical performance level of children of their age.

The effectiveness of a large-group intervention for basic concept acquisition administered to four- to five-year-old Head Start children by a speech-language pathologist was examined by Seifert and Schwarz (1991). Two classrooms were randomly assigned to the intervention group and two were assigned to the control group. Fourteen basic concepts that were most frequently missed by the children on the pre-intervention testing were chosen for intervention. The speech-language pathologist provided direct instruction in the classroom and interactive instruction during activities designed to demonstrate the concepts. Regular Head Start personnel helped with the materials during the interactive activities and followed the speech-language pathologist's lead in modeling the concepts. Incidental instruction was provided by teachers who were given a list of targeted concepts and were asked to use them during other classroom activities in naturally occurring communication. Children in the treated classroom showed significantly better gains than control children in concept acquisition. Additionally, comparison of the gains in the 14 target versus 14 randomly selected nontarget concepts strongly supported the proposition that gains

in the treated children were attributable to the group intervention.

Recommendations have also been made for strengthening the mental health components of Head Start programs and increasing parental involvement in the program in order for parents to learn how to stimulate their children. Little is known about the contribution of parent support components and family involvement in Head Start programs. One study of mothers with high, moderate, and low involvement in Head Start reported some encouraging results with fewer psychological symptoms, improved feelings of mastery, and better life satisfaction for the more involved participants (Parker, Piotrkowski, & Peay, 1987). Because the groups were not randomly assigned, it could be factors other than amount of involvement that lead to the results. Indirect effects for the children were not reported.

Ypsilanti Perry Preschool Project

One of the most extensively studied early interventions for children at risk is the Ypsilanti Perry Preschool project (Weikart, 1989). This project was implemented from 1962 to 1965 and was an intensive, child-focused preschool educational program for low income families. The children in the sample were selected based on socioeconomic level and low-IQ (70-85 range). The children were randomly assigned to groups that attended preschool or a control group that did not. Children began attending the preschool at 2.5 to 3 years of age for 2.5 hours, five days per week for 30 weeks over a two-year period before school entry. A high quality curriculum, High/Scope (Hohmann, Banet, & Weikart, 1979), used within the preschool classroom encouraged children to act upon their environment, reflect upon their experiences, engage in conversational opportunities, and develop social relationships. "Plan-do-review" cycles were used when conducting activities where teachers guided children to think through what they were going to do and consider how they performed following completion of each activity. The teachers had received extensive training, the teacher to student ratio was 1:5 or 6, and teachers made weekly 90-minute home visits to each family.

An immediate outcome of significantly higher IQs in treated children compared to control children faded as the children progressed through school (Wasik & Karweit, 1994). Follow-up studies at age 19 and 27 revealed substantial long-term benefits for school success, increased participation in the labour force with less dependence on welfare, and decreased criminal behaviour (Schweinhart, Barnes, Weikart, Barnett, & Epstein, 1993; Schweinhart, Berrueta-Clement, Barnett, Epstein, & Weikart, 1985; Schweinhart & Weikart, 1993).

Cost saving analysis that has accompanied follow-up studies has influenced policy makers and improved the public awareness of the benefits of early intervention. It has been estimated that for every \$1 spent on these interventions, there was a \$5-\$7 return, primarily to government coffers (Yoshikawa, 1994).

Carolina Abecedarian Project

The Carolina Abecedarian Project for children in poverty is another well-known and researched project (Ramey & Campbell, 1984; Ramey, Bryant, & Suarez, 1985). This program was implemented from 1972 to 1985 and was an intensive, child-focused, infant, preschool, and early elementary school intervention. The name "abecedarian" was chosen presumably because it means "rudimentary, a pupil who is learning the letters of the alphabet, a beginner." Children were selected through at risk screening. As children entered the study, they were matched by level of risk and maternal IQ and then randomly assigned to experimental or control groups. All experimental children entered the infant/preschool program between six weeks and three months of age and continued until kindergarten entry.

The infant program was early and intense with a minimum of seven hours per day, five days a week with a ratio of one adult to three infants. An infant curriculum, *Learning Games for the First Three Years* (Sparling & Lewis, 1981) emphasized language, motor, social, and cognitive development. The preschool program began at three years of age with emphasis on language and cognition using standard curricular materials taught through conversations, activities, and reading with the students. Control children were primarily in a daycare setting that did not emphasize skill development. All children received nutritional services, social support services, and medical care.

The infant/preschool intervention had a measurable impact on cognition in the first year of life and this impact was sustained over the preschool period (Ramey, Bryant, Campbell, Sparling, & Wasik, 1988). Comparison of program and control children revealed significant benefits in cognitive development as measured by IQ tests and developmental scales. Notably, the performance on the McCarthy Verbal Index (McCarthy, 1970) was significantly higher at 3.5 and 4.5 years for treated children compared to control children. Ramey et al. (1988) state that if the performance of the control group can be taken as an indication of risk during this developmental period, then the early intervention program reduced the risk for borderline and lower intellectual functioning by a total of 79 percent.

A special school age program was created and differentially applied to various groups of children. At kinder-

garten entry, one-half of the experimental subjects received the additional special school age program, thus creating two groups: a) a group who had received infant/preschool intervention only, and b) a group who had received infant/preschool intervention + the special school age program. At kindergarten entry, one-half of the control children were placed in the special school age program creating two groups: a) a group who received the special school age program only and b) a group who had received neither the early or school age programs. These assignments allowed for examination of the effects of various combinations of programs. The special school program began in kindergarten and continued to the end of grade two. The program involved resource assistance from certified teachers who worked extensively with the children, their teachers, and parents in order to ensure the acquisition of school skills. Home visits and summer programs with tutoring in reading and math were included.

At the end of kindergarten, the groups that received the infant/preschool + school program and the infant/preschool program only demonstrated the best school achievement scores, which were clearly better than those of the controls. The group that received school treatment only was not appreciably different from the control group, showing that the school-age program without the earlier preschool intervention "...was not sufficient to bring the children... to the level of those who had received the intervention in infancy and during preschool" (Karweit, 1994, p. 71).

A follow-up when the Abecedarian children were 12 and 15 years old showed that the positive effects of the infant/preschool program on intelligence and academic achievement were maintained, and in some cases became stronger (Campbell & Ramey, 1995). These findings attest to the powerful influence of early intervention as a foundation for school.

Milwaukee Project

The Milwaukee Project (Garber, 1988), an intensive child-centred program started in the late 1960s for children of cognitively challenged and impoverished mothers, reinforced that an early start to the program, with continued support in early elementary grades, can produce impressive cognitive gains that are maintained. The program consisted of an infant stimulation component that began at three months of age; followed by a preschool education that emphasized language, problem solving, and academic readiness, followed by placement in better quality elementary schools and summer programs for reading and math. The resulting IQ gains in grades one through four were similar to a low risk control group.

Project CARE

Programs that included a considerable focus on parenting or family education components will now be considered. Project CARE was one such example. Project CARE was an extension of the Carolina Abecedarian Project. An intensive family education component was added to the original program to determine if the infant/preschool program + family education would have more positive effects than a family education program alone (Ramey, Bryant, Sparling, & Wasik, 1985; Wasik, Ramey, Bryant, & Sparling, 1990). The same procedure as above was used to recruit families, with random assignment to the Child Development Centre + family education program, family education program only, or control condition. The curriculum was the same as described earlier for the preschool program.

The family education component was designed as a home visiting program with visits every 10 days and monthly meetings to discuss nutrition, health, and safety (Sparling, Ramey, & Wasik, 1991). The family educators were paraprofessionals who were trained and supervised by professional staff. The curriculum for family education included problem-solving for child rearing, home and financial management, interacting with children, and facilitating cognitive and social growth.

Data collected on developmental milestone acquisition and intelligence at six month intervals up to 36 months of age and then at 48 and 54 months consistently revealed that the preschool + family education program was superior to family education only and that the children in the family education program only did not differ appreciably from the control group. These findings support the effectiveness of developmental day care with or without family education to significantly increase cognitive function in at risk children. The findings did not support the effectiveness of a family education program alone via home visiting.

Syracuse University Family Development Research Program

The Syracuse University Family Development Research Program (Honig, 1977; Honig & Lally, 1982) was an intensive program implemented from 1969 to 1975. The program included extensive child care and parent education. The parents were taught to use learning games with their children through weekly home visits and activities at the child care centre. This program began prenatally and served young, primarily single, low income mothers. Health, nutrition, and other human service resources were offered, as well as assistance in family relations and employment. High quality child care was provided from six months to five years of age.

On entry to school, treated children compared to nontreated did not demonstrate higher cognitive function but did show better performance in the socio-emotional area according to teacher ratings of behaviour. Follow-up assessment of the children at 15 years of age showed that program girls, but not boys, performed better in school. Significant decreases in criminal behaviour with associated cost savings to the social system were also found for program children. However, high attrition rates with almost 25% of the original participants not completing the program and less than 50% being available for follow-up, limit the confidence one can put in the results.

Chicago Child and Parent Centers

The Chicago Child and Parent Centers, a program similar to Syracuse, has expanded since its inception in 1965. This program provides preschool classes, enriched kindergarten and first grade, and considerable parent support and involvement for disadvantaged families. The program is designed to prepare children for school through promotion of language and literacy skills. Long-term follow-up comparing program children to matched samples of non-program children have found greater school achievement, less delinquency, and better life skill competence for treated children (Fuerst & Fuerst, 1993; Reynolds, 1997).

Parent Education Programs

Often parent education is combined with child-focused interventions; however, a variety of programs that emphasize parent education and support have been implemented and studied. Home visiting is a common method used, as is centre-based parent education. Parent education can be classroom-based or a hands-on demonstration with their own children at home or other children in a daycare program. Training may focus on safety, health, general childcare, family relationships, child/parent interactions, or teaching specific cognitive or linguistic skills. Other supports may be available for home management, life skills, and job skills. Early intervention programs that primarily emphasize parent education and support with minimal or no direct child programs have demonstrated few consistent, durable effects.

Gordon Parent Education Program

The Gordon Parent Education Program (Jester & Guianagh, 1983) was a moderately intensive, home-based visiting program designed to train indigent mothers to facilitate cognitive and language learning in their children. Parents were taught to facilitate specific developmental goals by paraprofessional home visitors.

The three year program was composed of three phases. Phase 1, Infant Stimulation Through Parent Education (three months to one year), consisted of weekly visits in which mothers were taught a new game each week designed to advance cognitive growth and interaction following a Piagetian model. Phase 2, Early Child Stimulation Through Parent Education (one to two years), was an extension of the infant program with developmentally appropriate activities taught through home visiting. In Phase 3, Home Learning Approach to Early Stimulation (two to three years), home visitors taught mothers activities from the *Child Learning Through Child Play* curriculum (Gordon, Guianagh, & Jester, 1972).

Families of newborns were recruited in 1966 and 1967 and families of two-year-olds were recruited in 1968. The design of program participation allowed for examination of longitudinal influence and different levels of participation through systematic assignment of families to eight experimental or control groups. In the experimental groups, one group received all three years and other groups of children, included for one or two years, received every possible combination of the three phases. All children were tested yearly for cognitive level up to six years of age and in long-term follow-up at 10 years of age.

When tested at four years of age, those groups with at least two consecutive years of intervention had higher IQs than control groups. Further, those children with one year of intervention in Phases 1 or 3 had large gains in IQ. Positive effects were maintained at six years of age for groups that had two consecutive years or Phase 3 only of the program. Follow-up at 10 years of age for IQ, special education referrals, and retention revealed that those children in the program for all three phases or for Phase 2 and 3 had the largest effects when compared to controls (Lazar, Darlington, Murry, Royce, & Snipper, 1982). For effects to be maintained, it appeared that two consecutive years of intervention were required.

The Mother-Child Home Program in Bermuda

The outcomes of a more general program, The Mother-Child Home Program in Bermuda, were studied by Scarr and McCartney (1988). This program was a home visiting program for two-year-olds sponsored by the government. Visits occurred twice monthly and involved demonstration of play techniques with toys brought to the family that were supposed to promote cognitive and social development (Levenstein, 1977). Few effects were demonstrated for parent attitude or behaviour or for child motivation or behaviour, even for the low income subgroup. However, controls may

have been receiving comparable experiences because almost all mothers in Bermuda work and children are in group daycare from age two.

Parent-Child Development Centre Model

The largest government sponsored program that provided extensive parent education and support to the mothers of disadvantaged children was the Parent-Child Development Centre Model (Andrews et al., 1982). This program was implemented from 1970 to 1980 in three sites with differing starting times, amount of time in the program, and intensity of program. Programs began in Birmingham, Alabama and New Orleans, Louisiana, included children two to five months of age and lasted three years. Both programs consisted of full-time infant and toddler programs plus parent education, with Birmingham having a significantly more intense parent education program than New Orleans. Parents were educated through a variety of experiences in the infant and toddler programs, including classes, demonstrations, learning from other mothers in the centre, and teaching other mothers in the centre. The third site selected was Houston, Texas where one of the few programs for an ethnic group, Mexican American families, was offered and the outcomes studied (Johnson, 1990). This program consisted of home visiting and parent education when the children were one to two years of age and centre-based parent education when the children were two to three years of age, along with a child-focused program.

Developmental and IQ assessments were done at regular intervals during all three programs, and at the end of the program and at four years of age for Birmingham and New Orleans. The results were variable across the testing period. By two years of age the treated children in the Birmingham and Houston models performed significantly better than controls; however, the New Orleans model children did not differ from controls. At the end of the programs (i.e., three years of age), the largest IQ effects were found in the Birmingham program, followed by New Orleans, and then Houston. However, one year after the program (i.e., four years of age), the New Orleans program had a stronger effect than the Birmingham program.

Reviewers of the literature on parent education alone as an early intervention have concluded that the impact of these programs do not appear to be as powerful as programs that directly intervene with the children (Barnes, Goodson, & Layzer, 1996). To assume, however, that parent education is unnecessary does not seem warranted. Parent education programs aimed at improving parent-child interaction patterns have shown some positive indicators, as have training programs for

those parents who maltreat or neglect their children (Barnard, 1997; Barnett, 1997).

Parent-Child Development Centre Model

Large scale, multi-focal or two-generation early intervention programs for children and their families living in poverty, funded by the US Department of Health and Human Services, are currently being evaluated (St. Pierre, Goodson, Layzer, & Bernstein, 1994). These Parent-Child Development Centre Models provide a developmentally appropriate childhood program, parenting education, and an adult education, literacy, or job skills training component with coordination of service access to existing programs and home visiting. At present, the impact of these programs has been modest, particularly considering the cost involved (St. Pierre & Layzer, 1998).

What Kinds of Programs are Effective for what Families?

Some of the answers to these questions are embedded in the studies described above. Examination across studies supports more advantages to children and parents when the program is lengthy, begins early, continues to provide support into school (i.e., more intense), focuses on the child directly, fosters interactions, has specific and targeted child attainment goals, and has emphasis on cognitive and linguistic goals. Innocenti and White (1993) completed a meta-analysis to determine if more intense early intervention programs resulted in better outcomes. Although the evidence was somewhat sparse and inconsistent, these researchers conclude that the weight of the data from multiple sources support that more intense programs yield better results. Karweit (1994), in a comprehensive review of the impact of intensity, concludes that the most intense programs in relation to duration and timing (i.e., those that start early) produce the largest and most lasting effects.

Although different curricula are rarely contrasted in a single study, clear superiority of one curriculum approach over another or specific components of any curriculum are not evident in the literature. Reviewers have been unable to identify particular components of curricula that lead to better effectiveness and have concluded that organized programs that systematically target developmentally appropriate skills produce good results (Evans, 1975; Haskins, 1989; Lazar & Darlington, 1982). The dominant models over the years have included Montessori with set materials and activities in context with child interest determining routine, Behavior Programs with a direct teaching strategy focusing on pre-academic skills, Open Education with discovery-oriented learning focusing on socialization, and Con-

structive Programs providing developmentally appropriate activities to induce learning (Spodek & Brown, 1993). All models appear to improve performance, with didactic programming showing somewhat stronger effects, especially for boys (Miller & Dyer, 1975). In one study, child-directed programming showed superiority over teacher-directed or in-between models (Marcon, 1992). The higher quality programs which produce the most positive results generally are those provided by highly qualified staff, with low teacher-student ratios, and classrooms which rate highly on scales of classroom quality (Bailey, 1997). Thus, it can be concluded that very different forms of intervention can be effective and that superior outcomes result from quality programs.

Cognition and language, however, have been identified as important curricular components. Considering all of the early intervention programs studied, the Abecedarian Project had one of the most comprehensive foci on socio-linguistic development within the daycare (McGinness & Ramey, 1981). It has been suggested that the robust effects of this program may be attributed to the focus on language and cognition in particular (Bryant & Maxwell, 1997).

Child and family characteristics have not been the predominant focus of studies to date. However, some literature does suggest differential effects of specific programs with girls performing better than boys (Syracuse University Family Development Research Program - Honig & Lally, 1982; Early Training Project - Gray, Ramsey, & Klaus, 1983; Philadelphia Study - Beller, 1983), and with African American children being more responsive than Caucasian children (Lee et al., 1988). Given the ever increasing diversity of cultural and linguistic backgrounds among newcomers to Canada, the issue of congruence between the programs we offer and the backgrounds of our ethnic population is significant.

Summary of Effectiveness and Program Features and Participant Characteristics that Influence Effectiveness

Comprehensive reviews of the early intervention literature (c.f., Bailey, 1997; St. Pierre & Layzer, 1998) can be summarized as follows. For child-focused, centre-based approaches that provide high quality early childhood programs for one to two years, treated children compared to nontreated children show:

1. Short-term positive increases in cognitive development (see Barnes et al., 1996; Barnett, 1995; Bryant & Maxwell, 1997)
2. Trends toward positive higher socio-emotional functioning (Honig, Lally & Mathieson, 1982; Lee et al., 1988)

3. Persistent achievement in and out of school, including reduced grade retention and placements in special education; greater rates of high school graduation and college attendance; improved rates of employment and self support; lower rates of criminal behaviour, teenage pregnancy, and welfare dependence (Schweinhart, Barnes, & Weikart, 1993; Schweinhart, Berrueta-Clement, Barnett, Epstein, & Weikart, 1985). Significant savings to government through reduced expenditures in education, social, and health services, and increased tax revenues through increased employment and earnings for treated children have been reported also (Cohen & Radford, 1999).

4. Stronger long-term benefits with programs that are more intense and programs that provide follow-up support in school (Wasik & Karweit, 1994, Reynolds, 1994), particularly in the areas of keeping pace with peers and reducing antisocial behaviour (Yoshikawa, 1995).

5. Greater overall progress with regular and consistent child and parent participation (Bryant & Maxwell, 1997).

For programs that intend to indirectly affect children's development primarily through parenting programs that are home-based, centre-based, or both, the following can be concluded:

1. Although some studies show short-term changes in parental knowledge, attitude, and behaviour (Andrews et al., 1982; Johnson & Walker, 1991), contradictory results are common in programs with a major emphasis on parent education (Olds & Kitzman, 1993)

2. Parental education programs alone have shown few, if any, demonstrable effects on child outcomes (Barnes et al., 1996; Barnett, 1995; Clarke-Stewart, 1988).

3. Although home visiting programs in general have not been shown to improve child development, there is some evidence of decreased incidence of child maltreatment and reduced visits to hospital emergency departments (Olds et al., 1997; Olds et al., 1998). It has been suggested that home visiting may be necessary for some children, but does not appear to be sufficient to improve child outcomes (Weiss, 1993).

4. For children in very deprived circumstances, however, a comprehensive home visiting program focused on improving parents' abilities to facilitate specific developmental milestones has been shown to produce positive child outcomes with families in the Gaza Strip (Oakland & Ghazaleh, 1996). Similarly, an intensive home visiting program in Jamaica also resulted in child improvement on developmental measures (Powell & Grantham-McGregor, 1989).

5. The contribution that parent involvement has in improving effectiveness of child-centred programs has also been questioned (White, Taylor, & Moss, 1992). Infant/preschool programs appear to be necessary as the largest effects come from programs that target children from infancy through early elementary grades (Karweit, 1994). Continuing support or intervention is needed for children at risk as they enter school. Continued follow-up appears to be important for maintenance of the long-term effects of infant/preschool early intervention programs.

The Potential Contribution from the Speech-Language Pathologist

"Over the years, more complex early intervention programs have been developed which have drawn upon the approaches and expertise of different disciplines and emerging knowledge about child development and risk factors" (Cohen & Radford, 1999, p. 4). Knowledge of effective means for promoting child development have been integrated into many programs. The speech-language pathologist is a professional who has expertise that could enhance early intervention programs. Application of speech-language pathology techniques and strategies to facilitate oral language and early literacy and measurement of these outcomes are two potential contributions.

The need to develop language skills in early intervention programs has been acknowledged and usually has been addressed as part of the early childhood curriculum presented by teachers. Despite the stated focus on language facilitation, particularly in the area of pragmatics (McGinness & Ramey, 1981), measurement of specific language, social communication, or early literacy skills are not typically the major focus of reported outcomes in early intervention programs for disadvantaged children. The speech-language pathologist could participate in the focused measurement of the language and literacy development of children in early intervention programs. The speech-language pathologist has experience in and a unique understanding of the treatment and the subsequent measurement of outcomes in language skills and social communication abilities (Prizant & Wetherby, 1998). Advances in communication and early literacy skills may function as mediating factors partially responsible for the positive and enduring educational and social-behavioural outcomes reported in early intervention programs.

Although speech-language pathologists typically provide service to disorder populations, we can also contribute to language development of all children. We are aware that children with weak language skills are

vulnerable to school and life failure. Alternately, it is known that strong language skills are associated with success in school and in life (Nelson, 1993). Further, it is known that good language skills serve as a protective factor making children at risk for failure more resilient to those risk factors (Hechtman & Weiss, 1986; Herrero & Hechtman, 1994). Positive effects have been demonstrated when the expertise of the speech-language pathologist is applied in early grade classroom settings to children with weak language skills (e.g., Hoffman & Norris, 1994; Wilcox & Kouri, 1991). Participation by speech-language pathologists in early intervention programs is one means for enhancing resilience to risk for disadvantaged children.

The organization of comprehensive speech and language services in the schools are often referred to as a continuum that encompasses communicative development, communicative differences, and communicative disorders (e.g., Ontario Association of Speech-Language Pathologists and Audiologists, 1996). Preventative services are provided by the speech-language pathologist who assists staff in the development of language learning programs for all students. Therefore, the continuum includes activities for communicative development (e.g., program development, staff and parent training, and consultation), communicative differences (e.g., resource assistance, teacher aide programs), and communicative disorders (e.g., direct programs in class or in groups, direct regular therapy). These concepts have been extended to preschool speech and language services utilizing an integrated service delivery system, such as in the Preschool Speech and Language Initiative in Ontario, Canada (Ontario Ministry of Health, 1996).

The Preschool Speech and Language Plan for Thames Valley is an example of a service that seeks to maximize the language learning of every preschool child (Thames Valley District Health Council, 1998). A full range of interventions, including promotion of healthy development, is a part of the multifaceted approach for this initiative. The range of interventions is illustrated in Figure 1 (Warr-Leeper, 1998). The continuum of programs and services is across the top of the figure from left to right. The continuum of child needs is in the three bottom boxes. The types of program/service and staff are in the middle two boxes. The shading in the continuum of child needs boxes indicates the programs/services above each box that would benefit children with those particular needs. Services/programs for the average child who is developing language and for children with weak skills extend from health promotion through public awareness and community education to caregiver education and mediated facilitation for children. An example of the type of contribution the speech-language

pathologist could make is evident in the previously reviewed study by Seifert and Schwarz (1991). A brief, large-group basic concept intervention program implemented by a speech language pathologist within the classrooms of Head Start was highly effective. Efficiencies in use of the speech-language pathology resources were realized with the service delivery model chosen. Many children were served, including those with weak but not disordered language skills. Many more children would benefit in the future because staff were coincidentally taught in a simple, demonstrated, in context fashion to use the speech-language pathologist's techniques and content for teaching basic concepts.

Another possibility for the disadvantaged child in daycare may include mediated facilitation of language through caregivers trained by the speech-language pathologist. The speech-language pathologist could also implement or provide consultation regarding language-focused curriculum materials. Materials might include such programs as the Parent-Child Mother Goose Pro-

gram (Lottridge, 1990) for development of phonological awareness; *Building a Language-Focused Curriculum for the Preschool Classroom, Volume II: A Planning*

Guide (Bunce, 1995a) for specifically targeted communication goals in a preschool context; or *Learning Language and Loving It* (Weitzman, 1992) for teaching communication strategies.

For younger children, programs that foster development and parent interaction, such as Learning Games for the First Three Years (Sparling & Lewis, 1981) could be used.

Outcome studies regarding the benefits of the Parent-Child Mother Goose Program and Learning Language and Loving It are not available in the literature, however, anecdotal evidence from speech-language pathologists suggests that the programs have the potential to advance the communication competence of children. Learning Games for the First Three Years when implemented within the infant/preschool program of the Caro-

Figure 1
Preschool Speech and Language Programs and Services¹ as a Continuum.

PROGRAM/ SERVICES	Public Awareness/Community Education about the development of speech and language skills	Caregiver ² Education (General) Teaching basic facilitation techniques, and speech and language milestones.	Caregiver Education (More Specific) More specific educational material directed towards the needs of a specific child or children.	Stimulation Methods for Caregiver Mentoring and skill development training for specific communication domains.	INDIRECT (MEDIATOR MODEL) -More intense educational programs blended with collaborative consultation. Speech-Language Pathologist (SLP) demonstrates stimulation techniques specific to child needs for the caregiver.	DIRECT		
						Clinical Training Group	Group Therapy	1:1
CHILD'S NEEDS INCREASE						Continued education and mentoring for caregivers blended with limited SLP treatment for child		
Type of Program/Service:	Health Promotion Development			Prevention of Speech and Language/Difficulties/Maximizing		Least Intensive Intervention -----> Most Intensive		
Staff:	Health Promoter/SLP provides content			SLP		SLP		
Communicative Development (Speech and Language Facilitation)	Shaded			Shaded		Shaded		
Communicative Differences (Weak Language Skills)	Shaded			Shaded		Shaded		
Communicative Disorder	Shaded			Shaded		Shaded		

Warr-Leeper, G. (1998)

* SLP = Speech-language pathologist

Shaded areas indicate the programs/services that would benefit children with those particular needs; Blank areas indicate programs/services that would not be of benefit to children with those specified needs. For example, a child with a communicative disorder would benefit from all types of programs/services, ranging from health promotion to direct therapy, therefore all areas are shaded; to encourage communication development, it would not be appropriate to offer direct therapy 1:1, therefore this cell is empty.

1. The intensity of the child's needs and the service needs become more intensive as one progresses from the left of the continuum to right (moving from the general to the specific).

2. Caregiver may refer to a parent, early childhood educator, resource consultant, babysitter, lay home visitor for healthy babies, etc.

lina Abecedarian Project for children in poverty were found to improve IQ and school achievement for participating children compared to control children (Ramey & Campbell, 1984; Ramey, Bryant, & Suarez, 1985). It is hoped that effectiveness studies of these programs will be forthcoming.

Support for the effectiveness of a Language-Focused Curriculum implemented in a preschool setting has been reported by Rice and Hadley (1995) and Bunce (1995b). Positive gains in communication abilities have been demonstrated for native speakers of English with and without language impairments and for children learning English as a second language. Hadley, Simmerman, Long, and Luna (2000) recently reported on the positive benefits of implementing a language-focused curriculum for environmentally disadvantaged children in the early years of school. A classroom-based training program that embedded vocabulary and phonological awareness into the regular education classrooms of inner-city children was implemented by the regular teacher and the speech-language pathologist. Following a six-month intervention, children in the collaborative training classroom compared to children in the standard classroom showed superior gains in receptive and expressive vocabulary, beginning sound awareness, and letter-sound associations with generalization to untrained sound analysis tasks. Studies showing the effectiveness of collaboration between the speech-language pathologist and the teacher are encouraging.

Conclusion

There are children at risk in all socio-economic strata (McCain & Mustard, 1999); however, the environmentally disadvantaged child is at particular risk. It is apparent that early intervention, although it does not eliminate risk, can lessen the impact.

Speech-language pathologists are, by nature of their education, clinical experiences, and knowledge base in language, uniquely situated to participate in early prevention activities for disadvantaged children. By having a broad spectrum of experience in the facilitation of language development, we can provide valuable information, training, and consultation to children's caregivers and to service networks for children. The speech-language pathologist has the capacity to enhance the communication competence of all children in our communities. Let us consider multiplying our impact through participation in early intervention and prevention of communication disorders for children at risk (American Speech-Language-Hearing Foundation, 1989).

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