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ABSTRACT

Summaries of research results concerning school-age children and youth are provided in four sections of this report. Each of the four substantive sections focuses on one of the following aspects of schooling: curriculum, classroom and school management, career preparation, and special needs and programs. The pages of the summary are organized in a column format: the first column lists the findings, the second gives bibliographic information, and the third provides interpretations of the findings. Very brief descriptions of curricula are occasionally included. (RH)

MATRIX NO. 37

RESEARCH ON SCHOOL-AGE CHILDREN AND YOUTH

Interagency Contributions
May 1981

RESEARCH ON SCHOOL-AGE CHILDREN AND YOUTH

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SECTION ONE
RESEARCH RELATING TO CURRICULUM

Findings	Source	Interpretation
I. Basic Educational Skills-Reading		
Factors that contributed most positively to reading gains in 43 secondary reading classrooms were: • discussing homework or the reading content • providing drills • reading aloud • focusing instruction on small groups • giving short quizzes	Stallings, J. *et al. A study of basic reading skills taught in secondary schools.* Palo Alto, CA: Stanford Research Institute, 1978.	Students made fewer gains in classrooms in which 40% to 50% of the time was allocated to written assignments and silent reading.
Evidence clearly favoring one instructional approach over another in field settings is difficult to find. Nevertheless, a repeating pattern of findings concerning both what is taught and how it is taught can be detected from several decades of applied research. When skill in word recognition is the primary objective code oriented programs tend to	Becker, W.C. Teaching reading and language to the disadvantaged – What we have learned from field research. *Harvard Educational Review,* 1977, 47(4), 518-543. Resnick, L.B. *Beginning reading instruction: Which method is best?* Pittsburgh, PA: University of Pittsburgh, LRDC, 1978.	Decoding is taught by teaching 40 sounds and by teaching how to blend sounds rapidly together. Language oriented programs emphasize methods that attempt to use the child's own dictated and written stories as the material for teaching reading.

Findings	Source	Interpretation
produce better results. When comprehension is the primary objective there is no clear advantage to either code-or-language oriented programs.		
The ability to read with understanding is an essential skill in modern society. Yet, it is a skill that a substantial number of people never completely master.	Spiro, R.J., Bruce, B.C., & Brewer, W.F. *Theoretical issues in reading comprehension.* Hillsdale, NJ: Lawrence Erlbaum Associates, 1980.	The question – Why hasn't research on the reading process given us answers to the problems encountered in learning to comprehend what is read? – has been answered in the following way: A complete understanding of the overall problems of reading will consider issues such as motivation, physical health, parental attitudes, socio-economic status, teacher personality, and classroom organization.
Basic Educational Skills-Writing		
High school classes are organized to allow approximately 3% of class time for writing assignments of paragraph or longer length.	Applebee, A. *A study of writing in the secondary school.* Final Report. Washington, DC (NIE-G79-0174), 1980. (Available in ERIC: ED 197 347.)	The current emphasis on testing students in reading, math, and English usage requires mainly mechanical use of writing (e.g., short answers; fill in blanks; exercises; and drills).
Writing instruction in elementary school is limited mainly to practicing vocabulary words, capitalization, punctuation, and penmanship drills.	Graves, D.H. *Balance the basics: Let them write.* New York, NY: Ford Foundation, 1978.	Graves suggests that the quality of student writing is problematic because elementary students are being taught mainly to read rather than to write.

Findings	Source	Interpretation
Basic Educational Skills—Writing (continued)		
Very few students (i.e., 7%) report that they are engaged routinely in the full range of writing processes during instruction.	National Assessment of Educational Progress. *Writing achievement, 1969-79.* Results from the Third National Writing Assessment, Volumes 1-3. Washington, DC: U.S. Government Printing Office, 1980.	The teaching and learning of writing would be improved by an increased focus on writing processes (i.e., pre-writing planning activities, composing and revising) rather than the current focus on products (i.e., assignments written only for evaluation purposes).
Writing coherent paragraphs seems to be best learned when school writing is functional (i.e., it is used for actual communication such as dialogue journals between student and teacher).	Staton, J. *Analysis of dialogue journal writing as a communicative event.* Final Report (NIE G 80 0122). Available through Center for Applied Linguistics, Washington, DC.	Writing instruction should focus on activities that enable students to write for actual communicative purposes, about topics they choose themselves.
Basic Educational Skills-Math		
Children understand certain principles of counting such as one-to-one correspondence, stable ordering, and cardinality even when they make counting errors. They also understand principles of addition and subtraction for sets of numbers less than 5.	Gelman, R., & Gallistel, C.R. *The child's understanding of number.* Cambridge, MA: Harvard University Press, 1978.	Young children's ability to count forms the basis of their ability to estimate quantities.
Children's errors in arithmetic often reflect systematic strategies that are consistent with their language habits.	Ginsburg, H. *Children's arithmetic.* New York, NY: Van Nostrand, 1977.	Knowing about the child's informal activities in math or numbers can help teachers predict how the child will handle formal mathematics.

Findings	Source	Interpretation
Basic Educational Skills—Math (continued)		
Training in producing ordered series enhances the child's ability to solve simple addition and subtraction.	Brainerd, C.J. *The origins of the number concept.* New York, NY: Praeger, 1979.	Math curricula should concentrate on numbered ordering rather than set theory concepts like many to one correspondence.
Few students of *either* sex continue to study mathematics at the advanced level.	Fennema, E. Sex related differences in mathematics achievement. *Educational Researcher,* 1977, 14, 51-71.	The mean number of years of high school mathematics is 3.62 for males and 3.27 for females.
Thirty-one percent of high school males and 27% of high school females take a 4-year mathematics sequence.	Chipman, S.F., & Thomas, V.G. *Women's participation in mathematics.* Washington, DC: National Institute of Education, 1980. Armstrong, J.M. A national assessment of achievement and participation of women in mathematics. *Education Commission of the States Report No. 10-MA-60,* 1979.	There are small sex differences in the percentages of students taking a 4-year sequence of math in high school. This change in math course participation of females occurred between 1960 and 1972. In the 1960 Project Talent Sample, 9% of the girls and 33% of the boys were taking 4 years of math. In the 1972 National Longitudinal Sample, about 39% of males and 22% of females had taken 4 years of high school math.
Virtually no one who was not already planning a math-related career by 12th grade later switched into a math-related career by age 29.	Wise, L., Steel, L., & MacDonald, C. *Origin and career consequences of sex differences in high school mathematics achievement.* Washington, DC: National Institute of Education Grant NIE-G-78-001, 1979.	The early decision to enter a math-related career appears to be a critical step toward actual entry into a math-related career.

Findings	Source	Interpretation
Basic Educational Skills—Math (continued) Grades in mathematics are substantially lower than grades in other subjects for both males and females.	Educational Testing Service. *National college-bound seniors, 1979.* Princeton, NJ: College Entrance Examination Board, 1979.	
II. Science Education		
Undergraduates who were asked to draw the path a ball would take after being shot from various curved or spiraling tubes were wrong more than a third of the time. Their paths were strikingly reminiscent of the medieval theory of impetus.	Bert F. Green Michale McCloskey Department of Psychology Johns Hopkins University Baltimore, MD 21218	Misconceptions seem to survive even the formal process of scientific education. The teaching of physics may be improved by taking these misconceptions into account.
High school and college students have many misconceptions about physics: e.g., An object twice as heavy falls twice as fast. Air pressure is the cause of gravity.	John Clement Jack Lockhead Department of Physics and Astronomy University of Massachusetts Amherst, MA 01003	These misconceptions may be best understood as stages in the students' conceptual growth to complete understanding. They should be used in teaching.
Using the description of students' misconceptions and alternative conceptions devised by other researchers can lead to effective physics teaching in high school. By building on students' self-awareness, using special sensory experiences, and stimulating reflective discussion, more accurate concepts can be taught.	James A. Minstrell Department of Physics Mercer Island School District Mercer Island, WA 98040	Success at changing students' misconceptions depends on an accurate knowledge of those same misconceptions. Often, a great amount of trial and error and research are needed to acquire that knowledge.

Findings	Source	Interpretation
Science Education (continued)		
A sizable body of knowledge is prerequisite to many expert skills. Intuition is no longer beyond the reach of science.	Herbert A. Simon Jill Larking Department of Psychology and Computer Science Carnegie-Mellon University Pittsburgh, PA 15213	The knowledge must be indexed by a large number of patterns that guide the expert in a fraction of a second to relevant parts of the knowledge store. This constitutes a large part of what we call "intuition."
Many high quality curriculum materials exist for training thinking and learning skills.	Raymond S. Nickerson Bolt Beranek and Newman, Inc. 50 Moulton Street Cambridge, MA 02238	Available material provides an elaborate information base for the design of sound classroom practices for teaching thinking and learning skills.
Young children's confusions about physics concepts like latent and specific heat parallel in many respects the confusions of early scientists.	Susan Carey Department of Psychology M.I.T. Cambridge, MA 02139	Physics concepts are part of a larger structure of knowledge. The study of historical change may enlighten the teaching of concepts by providing a better understanding of children's ideas.
There are almost no graphs and charts in the leisure reading materials of adolescents. No graphs or charts appear in the school books before grade 4.	Stephen Kosslyn Ellen Kitzis Consulting Statisticians, Inc. 20 William Street Wellesley Hills, MA 02181	Schools, writers, and publishers are underutilizing an important communication device.
The amount of time people spend looking at each picture in a storybook depends both on how many pictures it takes to tell the story, and on how much of the story is told in the body of the text.	Julian Hochberg Department of Psychology Columbia University New York, NY 10027	Looking time may measure visual interest and allow researchers to formulate design principles for the best combination of text and pictures to sustain reader interest.

Findings	Source	Interpretation
III. Art, Music Education		
Cognitive capabilities such as spatial discrimination, organization, relationship comprehension and sequencing are enhanced by instruction in aesthetic education, which stresses perception, mastery of concepts and the manipulation of verbal and palpable materials, both auditory and visual. Art forms are abstract and symbolic structures embodying meanings necessary for all academic comprehension.	CEMREL Aesthetic Education Program CEMREL 3120 - 59th Street St. Louis, MO 63139	Experiences in understanding the formal, sensory and expressive aspects of all the arts through the manipulation of game-like activities and creative experiences with carefully designed curriculum materials enhance learning in other cognitive domains as well as having positive motivational efforts.
Sequentially organized learning materials divided into small incremental steps can facilitate instruction in creative and expressive artistic activities in both the visual arts and in music. Such instruction can be made sufficiently explicit to be implemented by the general classroom teacher with only occasional guidance from the art or music specialist.	SWRL Visual Art and Music Curriculum Program SWRL 4665 Lampson Avenue Los Alamitos, CA 90720	Art activities need not be construed as trivial, peripheral or recreational time-fillers, irrelevant to the basic school curriculum, but rather can be taught and learned as symbolic and basic skills essential to cognitive development.
Children at extremely early ages develop a capability for stylistic discrimination and the manipulation of metaphoric and figurative images, both verbal and visual. What once was believed to be a mysterious, magical activity (the production and compre-	Project Zero. Final Report to NIE. Washington, DC: National Institute of Education (NIE-G-00-3-0169), October 1978.	The reconceptualization of the basic skills curriculum to incorporate a broader array of symbolic processes, including a more extensive program of instruction in the figurative aspects of verbal usage, would be of great benefit

Findings	Source	Interpretation
Art, Music Education (continued)		
hension of the arts) is now understood as an intellectual process, developmentally and generally related to the acquisition of skills in other symbolic modes such as mathematics, discursive prose or scientific thinking. Just as Piaget has devised a sequence of cognitive stages marking the development of logical thought, Project Zero has created a developmental model describing artistic/aesthetic competence.		to the development of intelligence in the young child.
IV. Health and Physical Education		
Traditionally psychologists have thought of intellectual and motor functions as being distinct and only slightly related if at all. While few researchers question the importance of sensorimotor activities in the development of cognitive abilities in early life, the tie between motor and intellectual capabilities required for academic success becomes less clear after early childhood.	Keogh, J.F. The study of movement skill development. *Quest Monograph 28.* Brattleboro, VT: National Association for Physical Education, 1977. Rarick, G.L. Cognitive-motor relationships in the growing years. *Research Quarterly for Exercise and Sport*, 1980, 51(1), 174-192.	Among the many controversial issues in the field of school exercise and sport is the question of how motor experiences may impact positively on the cognitive functioning and the academic achievement of children. Tests designed to assess the intelligence of infants are largely motor in character and normed on the age at which children are expected to acquire particular modes of overt behavior. As researchers have pointed out, however, the tempo of development of cognitive-motor abilities in infancy varies so widely within and among babies that there is

Findings	Source	Interpretation
Health and Physical Education (continued)		
Investigation of the nature and structure of motor activities has pointed out that at least six factors account for variance in motor abilities with boys and girls, ages 6 to 10 years: (1) strength/power/body size (2) gross limb-eye coordination (3) fine visual motor coordination (4) fat or dead weight (5) balance, and (6) leg power and coordination.		little relationship between the scores attained in the first few months of life and the scores recorded at the end of the first year.
While some studies indicate that motor tasks calling primarily on coordination and balance are effective predictors of intellectual capabilities, the preponderance of evidence does not support this point of view. It would appear that the kinds of cognitive functions required for successful execution of motor tasks differ materially from those associated with academic achievement (i.e., where the focus of the latter is on symbolic and verbal facility, reasoning and abstract thinking).		In recent years there has been an increasing interest in the use of perceptual-motor programs with children with learning problems. However, the effects of a more generalized motor skill physical education program upon measures of intellectual functioning have resulted in inconclusive findings. Gains in measured intelligence as a result of motor training are generally attributed as much to special treatment effects as to the physical activities used in a program.

Findings	Source	Interpretation
Health and Physical Education (continued) Perceptual-Motor Training The general concept that motor experiences are valuable in the education of young children has been primarily attributed to Montessori. More recently Delacato developed a therapeutic program for children with neurological development problems. Many clinicians attest to the success of the Delacato physical motor skill approach to academic success in reading. However, there is no clear-cut evidence on the effectiveness of using cross-pattern creeping as proposed by the Delacato method. The promise of current research efforts in physical education is a more direct focus upon understanding motor skill development throughout an individual's lifetime. Movement skill has been defined as an organization of actions into a purposeful plan which is executed with economy. Organization is the key element in this definition of skill. Initial solutions may lack efficiency and effectiveness, but these movement skills become refined and reliable in the normal		The description of a movement process depends upon careful and precise analysis of the movement components that are organized to comprise the specific movement process. Researchers identifying themselves as developmental kinesiologists are using microanalyses of movements to describe movement

Findings	Source	Interpretation
Health and Physical Education (continued)		
course of an individual's physical activities. A more difficult movement problem for an individual is development of constancy, the flexible use of movement consistencies in a variety of movement situations.		component changes in an effort to describe development of movement processes throughout the life span.
One major contribution of past work in physical education has been to expand awareness of how efficient use of energy and body movement processes can improve an individual's overall total health beyond the school-age years.		
Research on Teaching Physical Education		
Research on teaching physical education has had to deal with the same methodological problems that pertain to classroom research. Attempts to take into account past criticisms of the study of teaching have resulted in studies that fall into three categories: (1) adapting available classroom observation systems for observing and recording various aspects of life in the gymnasium; (2) attempting to create methods for capturing significant nonverbal components of teaching and learning in physical education; and (3)	Locke, L. Research on teaching physical education. *Quest Monograph 28.* Brattleboro, VT: National Association for Physical Education, 1977. Oliver, B., & Taylor, L.J. Teacher characteristics and classroom behavior. *The Journal of Classroom Interaction,* 1980, 16(1), 11-18.	Movement education, individualized learning, behavioral objectives, team teaching, flexible scheduling, programmed learning, humanistic education, experimental education, teaching by discovery, and other strategies that bear upon the act of teaching have influenced both classroom and physical education settings. Improved methods of instruction are probably not the high payoff. Rather the payoff has been support for other recent research findings that point out that teachers who attend inservice, or professional development

Findings	Source	Interpretation
Health and Physical Education (continued)		
creating new observation systems for research on teaching physical education.		courses and/or clinics, are more effective than teachers who do not attend such workshops.
Instructional Methods		
Instructional designers in the field of physical education have used a broad spectrum of instructional approaches that range from discovery or exploring possible solution methods to formally structured techniques that control the learner through step-by-step error free progressions. In physical education a form of discovery learning called "movement education" has involved the teaching of basic movement patterns rather than specific acts to young children. The possible solutions to a problem may be quite varied, and the learning experiences encourage freedom of expression on the part of the observer. However, most writers point out that the consequences of error committal are by no means fully analyzed. The part played by error in human learning requires clearer interpretation before any conclusive statements can be made. What is most probable is that no simple strategy will be generally useful under all conditions.	Singer, R.N. To err or not to err: A question for the instruction of psychomotor skills. *Review of Educational Research*, 1977, 47(3), 479-498.	Most instructional researchers disagree with respect to the function and desirability of error making in the learning process. Those who advocate the discovery method in physical education believe that learners profit from their errors. The unresolved question in the discovery vs. structured debate is whether all physical or motor skills should be taught with the same strategy.

Findings	Source	Interpretation
Health and Physical Education (continued)		
If the purpose of learning a new skill is only for the highest level of performance in that skill, then a guided and prompted method of learning would seem to be the appropriate choice, especially in motor skills when there is concern for economy and/or efficient use of the body. If the purpose of the learning situation is to lead to the applications of what has been learned for transfer to other related skills and situations, then some form of discovery, problem-solving, or trial-and-error strategy should be employed.		
V. Nutrition Education		
Teacher training: Teachers want and need skills in nutrition information and educational methodologies.	Glotzer, J., & Nestor, J. (Eds.) *Nutrition education: A review of the literature.* USDA, Contract #53-3198-9-38 FNS. Washington, DC 20250, 1980.	Teacher training can be based on their perceived needs. Familiarization with available resources was found to be a high priority. Other school personnel also can benefit from the training.
The skills are best provided in in-service training rather than pre-service. Teachers' attitudes affect students' progress.		

Findings	Source	Interpretation
Nutrition Education (continued)		
Preschool: Adults eating with children during meals modeling desired eating behavior increased consumption of all components of the meal.	Highberger, R., & Crothers, L. Modification of eating behavior of toddlers in a day care setting. *Home Economics Research Journal*, 1977, 6(1), 48.	Meal time is an effective time for nutrition education and can change food habits. Preschool children will imitate parents, teachers, and peers.
Behavior modification techniques were successful in stimulating tasting and eating behavior.	Section, C.L., & Guthrie, H.A. Modification of vegetable-eating behavior in preschool children. *Journal of Nutrition Education*, 1972, 4, 100.	Willingness to taste new foods is a first step toward an important nutrition education goal, eating a variety of foods.
Nutrition education activities that allow preschoolers first hand experiences, active participation and a non-threatening environment have been most successful.	Juhas, L. Nutrition education in day care programs. *Journal of American Dietetics Association*, 1973, 63, 134.	Nutritional foods can be used for educational activities with young children.
Elementary: The amount of behavior change resulting from nutrition education decreased progressively at higher grade levels.	Head, M.K. A nutrition education program at three grade levels. *Journal of Nutrition Education*, 1974, 6, 56.	Nutrition education efforts start with the preschool age child and continue with a sequenced program in elementary and secondary grades. Successful programs integrated food experience and instruction.
The nutrition education program resulted in significant changes in nutrition knowledge but changes in diet, food preferences and anthoppmetric measures were not significant.	Baker, M.J. Influences of nutrition education of fourth and fifth graders. *Journal of Nutrition Education*, 1972, 4, 55.	Attaining knowledge about nutrition is important to further the goal of changing attitudes and food habits. Food habits take longer to change and usually short-term nutrition interventions do not allow enough time for changes in behavior to occur.

Findings	Source	Interpretation
Nutrition Education (continued)		
Secondary: The *discovery* method of teaching nutrition has been a successful approach to nutrition education. The Basic 4 food groups approach has been shown to be of low interest and effect for high school students.	Glotzer, J., & Nestor, J., *op. cit.*	Educational approaches in nutrition education can be matched to adolescent needs, concerns and American lifestyle.
VI. Social Studies Education		
Social Studies: National Assessment		
Analyses of social studies test items in economics, geography, history, and politics points out that the overall social studies achievement of the majority of American teenagers has declined since the early 1970s.	National Assessment of Educational Progress. Administered by the Education Commission of the States, 1860 Lincoln Street, Suite 700, Denver, CO 80295. Sample publications: *NAEP Education for Citizenship* (1976) *NAEP Changes in Political Knowledge and Attitudes* (1978) *NAEP Changes in Social Studies Performance* (1978)	The National Assessment of Educational Progress measured knowledge, skills, and attitudes in social studies and in the area of citizenship in 1968-69, 1969-70, 1970-71, and 1975-76. In the 1981-82 school year, a follow-up assessment of students will be conducted in the area of citizenship.

Findings	Source	Interpretation
Social Studies Education (continued)		
Social Studies: Instructional Practices The most extensively used instructional practices in social studies are lecture and discussion. The percentage of teachers who lecture "just about daily" is comparable across grade levels: K–3 (20%); 4–6 (24%); 7–9 (21%); 10–12 (32%).	Superka, D.P. *et al.* The current and future status of the Social Studies. *Social Education,* 1980, 44, 362-369.	Although there are many different interpretations of the terms "lecture" and "discussion," available survey and case study findings indicate that these instructional practices are used more extensively than students' reports or library work.
Social Studies: Curriculum There exists a strong similarity of social studies courses or topics taught at grade levels kindergarten through 12 across the nation. The following list of dominant courses or topics in social studies has persisted in elementary and secondary schools since 1955: K – Self, School, Community, Home 1 – Families 2 – Neighborhoods 3 – Communities 4 – State History, Geographic Regions 5 – U.S. History 6 – World Cultures, Western Hemisphere 7 – World Geography or History	Wiley, K.B. *The status of pre-college science, mathematics, and social studies education: 1955-1975. Vol. III: Social science education.* Report to the National Science Foundation. Boulder, CO: Social Science Education Consortium, 1977.	Although the Wiley (1977) data (and other studies) indicate common tendencies, reports also are filled with data that indicate the diversity of classroom experiences within the same school. While recent studies point out that there *is* evidence of similarity of courses, or topics, or textbooks, at the various grade levels across the nation, there is much less evidence about the specific content of these courses on a day-by-day basis.

Findings	Source	Interpretation
Social Studies Education (continued) 8 — American History 9 — Civics or World Cultures 10 — World History 11 — American History 12 — American Government		
Social Studies: Textbooks Tentative findings from available content analysis studies point out today's textbooks depict a more racially and ethnically pluralistic U.S. society than those of the 1950s.	Superka, D.P. *et al., op. cit.*	The textbooks of the 1950s showed primarily white people.
Social Studies: Problems Identified by Teachers Inadequate student reading abilities is seen by most secondary teachers as a serious problem in students learning social studies. Most secondary social studies teachers see lack of student interest in the subject of social studies as another major problem, but elementary teachers do not. (Weiss, 1978)	Shaver, J.P. *et al.* The status of Social Studies education: Impressions from three NSF studies. *Social Education*, 1979, 43, 150-153. Weiss, I.R. Report of the 1977 national survey of science, mathematics, and social studies education. Report to the National Science Fdn., Research Triangle Park, North Carolina: Center for Educational Research and Evaluation, 1978.	One unsolved problem that remains in teaching social studies is the problem of finding room in teacher preparation curriculums to deal with the many fields of knowledge that are included in the multiple definitions of: WHAT IS SOCIAL STUDIES?

Findings	Source	Interpretation
VII. Special Education		
Special Education Curricula		
"I CAN": individualized physical education curriculum for mentally impaired children and youth.	Developer: Janet Wessel Publisher: Hubbard Northbrook, IL	These curricula are designed to fill the educational needs of children whose handicaps are not properly accounted for in most teaching programs for regular students. Some of these curricula have been found useful for younger students in regular classes.
"Project MATH": Curriculum for teaching mathematics to mildly mentally retarded children and other children with special learning needs.	Developer: John Cawley Publisher: Educational Sciences Wallingford, CT	
"ME NOW" and "ME and MY Environment": Curricula for teaching biological science and other science related concepts to mildly mentally retarded children.	Developer: William Mayer Publisher: Hubbard Northbrook, IL	
"Project MORE": Curricula for teaching daily living skills and social skills to moderately and severely mentally retarded students.	Developer: Herbert Goldstein Publisher: Charles E. Merrill Columbus, OH	
"Social Learning Curriculum": Curriculum for teaching academic and social skills to students who are mentally retarded or have other learning problems.	Developer: Herbert Goldstein Publisher: Charles E. Merrill Columbus, OH	

Findings	Source	Interpretation
Special Education (continued)		
Technology Applied to Special Education		
Reading Machines for the Blind:		
Optacon: presents a tactile representation of print or writing for reading by *feel*.	Telesensory Systems, Inc. 3808 Hillview Avenue Palo Alto, CA 94304	These are examples of applications of modern high technology to educational problems of handicapped students, enabling them to use school books, participate in classroom instruction, socialize with others. These advances also can be used by other handicapped children and by older people.
Kurzweil Reading Machine: *reads* printed material mechanically-electronically, and *speaks* the contents in synthesized voice.	Kurzweil Computer Products, Inc. 33 Cambridge Parkway Cambridge, MA 02142	
Communication aids for those who cannot talk: Autocom, for example, permits user to make up messages by selecting sequences of letters, words, or phrases, to be printed or spoken.	Telesensory Systems, Inc.	
The Computer in Education:		
Interactive Language Instruction Assistance for Deaf (ILIAD): computer generates meaningful English sentences as examples or exercises; learner selects grammatical, inferential, or functional aspects of language to study.	Kirk Wilson & Madeleine Bates Boston University 1019 Commonwealth Avenue Boston, MA 02215	Instead of storing a finite set of lessons, ILIAD stores *knowledge* of English and creates lessons tailored to the needs of the student, who chooses the level and kind of problem to study. To be implemented on a microcomputer.

Findings	Source	Interpretation
Special Education (continued)		
Program for practice in decoding letters, blends, syllables for children with reading disabilities: computer generates items at measured levels of complexity according to student needs.	Carl Spring University of California Davis, CA 95616	Again, computer creates lessons, but since subject matter is simpler, can be implemented on smaller, perhaps hand-held device.
Special Education in the Least Restrictive Environment		
Studies conducted in this area have produced somewhat mixed inconclusive findings. For children with mild learning problems (mild mental retardation; specific learning disabilities) placement in regular classes frequently promoted greater academic achievement and more positive self-esteem than placement in special classes; however, children in regular classes often are socially isolated/socially rejected by their normal peers and often are not given the individual attention that may be required. Studies to test procedures designed to improve peer attitudes toward the handicapped child and to increase social interactions and social acceptance of the handicapped child in regular classes have been successful, though not uniformly so.	Guralnick, M.J. Early intervention and integration of handicapped and non-handicapped children. Baltimore: University Park Press, 1978. Kaufman, M.J., Agard, J., & Semmel, M.I. *Mainstreaming: Learners and their environments.* Baltimore: University Park Press, in press. Siperstein, G.W., Bak, J.J., & Gottlieb, J. Effects of group discussion on children's attitudes toward handicapped peers. *Journal of Educational Research*, 1977, 70, 181-184. Gottlieb, J., Semmel, M.I., & Veldman, D.J. Correlates of social status among mainstreamed mentally retarded children. *Journal of Educational Psychology*, 1978, 70, 396-405.	Although many handicapped students benefit from placement in regular classes, more effective procedures are needed to improve their social status and social interactions in such settings. Also needed are procedures to identify handicapped children who are most likely to benefit when placed in less restrictive environments.

Findings	Source	Interpretation
Special Education (continued)		
Special Education Assessment Instruments		
"Neurometrics": Computer analysis of brain waves and responses to stimuli differentiate groups of learning disabled children	John, E.R. Neurometrics. *Science*, 1977, 196, 139-140.	A number of special assessment instruments have been developed for identifying handicapped children and for helping teachers to specify the educational programs most suited for each child. Standard assessment instruments often are not appropriate for these special needs children and are not designed for prescribing teaching approaches for them.
"Test of Syntactic Abilities": test designed to measure the syntactic abilities of deaf students	Developer: Stephen Quigley Publisher: Dormac, Inc. Beaverton, OR	
"KID" – "Kent Infant Development Scale": scale designed to measure developmental status of young handicapped children	Jeanette Reuter Department of Special Education Kent State University	
"A.A.M.D. Adaptive Behavior Scale: Early Childhood Edition": scale designed to measure the social/adaptive skills of handicapped preschool children	Henry Leland Nisonger Center Ohio State University	
"Parsons Visual Acuity Test for the Severely and Profoundly Handicapped": test designed for use with persons who are unable to perform on standard acuity tests.	Developer: Charles Spellman Publisher: Bernell Corporation South Bend, IN	

Findings	Source	Interpretation
VIII. Computer-Assisted Instruction		
Student Achievement in General		
Computer-assisted instruction, which supplements instruction provided by teachers, is effective in increasing learning by elementary and secondary school students.	Edwards, J. *et al.* How effective is CAI? A review of the research. *Educational Leadership*, 1975, 33, 147-153 Edwards, J. *A survey of research on effectiveness of CAI.* Portland, Oregon: Northwest Regional Educational Laboratory, 1981.	When computer assisted instruction is substituted for instruction provided by teachers, studies report that students may achieve more or about the same as non-CAI students.
Reading Achievement		
CAI drill and practice in basic skills is an effective method for raising basic skills performance levels.	Maser, A.L. *et al. Highline Public Schools Computer-Assisted Instruction Project.* ERIC Document: ED 167 114, 1977.	Computer courseware in reading and language arts has helped to raise vocabulary and reading scores of students in grades 2 through 9.
Mathematics		
CAI drill and practice was more effective than workbooks in helping increase computational ability.	Modisett, D. Effects of computer assisted instruction on achievement in remedial secondary mathematical computation. *Dissertation Abstracts International*, 1980, 40, 5770-A(No. 8010982).	Computer courseware in math drill generally has been effective.

Findings	Source	Interpretation
Computer-Assisted Instruction (continued)		
Computer-Based Education		
Past research on the way that computers are used in classrooms has pointed out that the computer has the potential to contribute to a child's cognitive growth.	Licklider, J.C.R. Impact of information technology on education. In D.R. Deringer (Ed.), *Technology in science edueation.* Washington, D.C.: National Science Foundation, 1979.	At the present time, new computer technology is developing at a fast rate. Based on past findings on the slow adoption of computer-assisted instruction in schools, there is uncertainty as to the potential level of acceptance and use of newer microprocessor technology in schools.
Unanswered questions regarding the effects of computer use center on concerns such as the emotional and social consequences of computing. On the positive side, there may be gains in self-esteem and motivation associated with the mastery of the computer. On the other hand, there may be frustration and disappointment. Socially, computer competence may enhance a child's status in the peer group. Alternately, socially isolated children may use the computer as a way further to isolate themselves from their peers.	Sheingold, K. *Study of issues related to the implementation of computer technology in schools.* New York: Bank Street College of Education, May 1980.	

Findings	Source	Interpretation
Computer-Assisted Instruction (continued) Past research on the use of computers in schools has pointed out that the kinds of interaction that may occur cover a range of behavior. The kind of interaction permitted range from drill and practice, requiring the least active engagement on the part of the child, to using the computational power of the computer to solve problems, to stimulations, to designing new programs for new content. It also has been found that some of the important effects of students' use of computers may extend beyond the particular subject content that is included in the computer program. For example, students learning to compose music via computer also may acquire new problem-solving skills, or children learning math via computer may improve in different communication skills.	Howe, J.A.M., O'Shea, T., & Plane, F. *Teaching mathematics through LOGO programming: An evaluation study.* (DAI Research Paper No. 115). Edinburgh, Scotland: Department of Artificial Intelligence, University of Edinburgh.	The availability of the microcomputer in this decade – inexpensive, portable, and easier to maintain – makes possible a widespread use of technology in schools, homes, and community settings. It is generally agreed that there is enormous potential for increased instructional use of the microcomputer in schools, homes, community settings, as well as the workplace.

Findings	Source	Interpretation
IX. Classroom Organization: Time The notion that students should be observed to see how much time they spend learning was recently explored in a study of over 260 second and fifth graders. Typically, 2nd graders spend 2 hours and 15 minutes of alloted time per day in academic activities. 2nd graders 1 hour and 30 minutes daily in reading (38% of day) 35 minutes daily in math (16% of day) 8 minutes in science and social studies (3% of day) 5th graders 1 hour and 50 minutes daily reading (39% of day)	Rosenshine, B.V. How time is spent in elementary classrooms. In C. Denham & A. Lieberman (Eds.), *Time to learn.* Washington, DC: U.S. Department of Education, National Institute of Education, May 1980.	Studies of instruction in reading, language arts, and math in 2nd and 5th grade classrooms have been concerned with describing how time is spent in school. These exploratory studies were not intended to be prescriptive; i.e., they were concerned with describing current practice; they were not intended to identify *best* teaching method.

Findings	Source	Interpretation
Classroom Organization (continued)		
45 minutes daily in math (16% of day)		
17 minutes in science and social studies (6% of day)		
X. Effective Schools		
Studies are beginning to describe the manner in which urban city schools achieve success.	Brookover, W. *et al. Schools can make a difference.* East Lansing: College of Urban Development, Michigan State University, 1977.	Considerable evidence demonstrates that there are schools, serving disadvantaged populations in urban areas, which are unusually effective in raising the achievement levels of their students.
Researchers identify effective schools mainly through matching schools on some *input* variable such as student body composition, per pupil expenditure, or prior years achievement levels, and then comparing current average achievement scores. For any set of matched schools, those which had relatively high average student achievement levels were identified as unusually effective, while those which scored especially low were identified as unusually ineffective.		

Findings	Source	Interpretation
Effective Schools (continued) Effective schools that have been identified in the above manner show similarities in the following ways: • Strong administrative leadership by the school principal, in instructional matters. • A school climate conducive to learning; i.e., a safe and orderly school free of discipline and vandalism problems. • School-wide emphasis on basic skills instruction, which entails agreement among the professional staff that instruction in the basic skills is the primary goal of the school. • Teacher expectations that students can reach high levels of achievement. • A system for monitoring and assessing pupil performance that is tied to instructional objectives.	Cohen, M. *Instructionally effective schools: Research area plan.* Washington, DC: Research on Instruction Team, Teaching & Learning Program, National Institute of Education, 1981.	The five similarities found among effective schools seem quite sensible. They imply that a school — in which the principal and instructional staff agree on what they're doing, believe they can do it, provide an environment conducive to accomplishing the task, and monitor their effectiveness and adjust performance based on such feedback — is likely to be an effective one. This line of research stresses the need for an orderly, businesslike environment that permits teacher and students to devote time and energy to teaching and learning academic content. The need for mechanisms for systematically and frequently assessing student performance in the basic skills, which provides feedback to both teachers and pupils regarding their success, is identified in both effective school studies and effective classroom instruction studies. The notion that successful instruction is possible for themselves and their students also is supported in these studies.

Findings	Source	Interpretation
Effective Schools (continued)		
School Organization: Problem Solving		
Although the problems of urban schools are varied in detail and in local manifestations, solutions typically are crippled by very common maladies, such as: a. choosing solutions at a level of the school or district different from the level where the solution must be carried out, b. omitting vitally involved people from the decision making, c. setting unrealistic schedules for carrying out the solution, d. holding impoverished conceptions of humans and their organizations, and e. using haphazard instead of systematic procedures for solving problems.	Runkel, P.J., Schmuck, R.A., Anends, J.H., & Francisco, R.P. *Transforming the school's capacity for problem solving.* Eugene, OR: Center for Educational Policy and Management, 1978.	Experience in the DTA Project (Documentation and Technical Assistance) in Urban Schools pointed to the school's capacity for problem solving and to specific skills that make up that capacity: a. collaborative skill in communication b. skill in systematic procedures for solving problems c. skill in getting information and other resources from inside or outside the group d. skill in monitoring the effectiveness of skills listed here

Findings	Source	Interpretation
XI. Safe Schools		
Extent of the Problem		
11% of the nation's secondary school students had something of value stolen from them in a typical month, 1.3% was physically attacked, and a half of 1% was robben in the same period	*Violent schools-Safe schools: The Safe School Study Report to the Congress.* Washington, DC: U.S. Department of Health, Education and Welfare, 1978.	Theft of valued objects is by far the most common crime against other persons occurring on school grounds.
The risks of robbery and serious attacks are greater in junior high schools and urban areas.	*Ibid.*	The risks for youth ages 12 to 15 are especially high.
12% of secondary school teachers had something of value stolen at school in a typical month, and about a half of 1% was physically attacked, and the same percentage robbed.	*Ibid.*	The experience of teachers with personal crime is similar to that of students.
School Crime: Extent of the Problem		
Except for trespassing and breaking and entering, the great majority of all reported offenses in schools were committed by current students of the school.	*Ibid.*	School crime generally is not caused by outsiders.
17% of secondary school students fear they may be hurt or bothered at school.	Wayne, I., & Rubel, R. *Student fear in secondary schools.* Washington, DC: NIE Contract P-79-0034, 1980.	Many students fear for their well-being in schools.

Findings	Source	Interpretation
Safe Schools (continued) Available evidence suggests that acts of violence and property destruction increased through the 1960s to the early 1970s, but leveled off after that and even improved somewhat in urban areas.	*Violent schools-Safe schools: The Safe School Study Report to the Congress, op. cit.*	For the period 1971-76 the extent of school crime did not change and even improved despite popular impressions to the contrary. It still is a serious problem, but not necessarily a growing one.
Other Factors Associated with School Offenses The following factors are related to higher levels of self-reported violence against students: • higher crime rate and presence of fighting gangs in the area • larger schools, larger classes • less academic competition	*Ibid.*	The findings suggest that the following are important factors in school violence: • the neighborhood • impersonality of schools and alienation of students • school incentive structure • school governance The principal's leadership in being available to staff and students and creating a structure of order was critical to effective school governance.
Student Suspensions Based on nationally representative response of students and school staff, student suspension is not just based on student attitudes and behavior. It also is based on:	Wu, Shi-Chang. *The foundations of student suspension.* Washington, DC: NIE Contract P-79-0032, 1980.	Student suspensions depend not just on student behavior but also on teacher perceptions and beliefs; the school's administrative structure for handling school matters; and the presence or in-

Findings	Source	Interpretation
Safe Schools (continued)		
• teachers being uninterested in students and feeling students are incapable of solving problems		stitutional biases against minorities and low achieving students.
• disciplinary matters handled largely by administrative rules.		
• schools unable to provide consistent and fair discipline.		
• academic and racial bias among school personnel.		

SECTION THREE
RESEARCH RELATING TO CAREER PREPARATION

Findings	Source	Interpretation
XII. Career and Vocational Education		
Vocational Education Programs		
Educators, economists, and employers have cooperated in career education demonstration and development projects.	Education and Work Group, National Institute of Education. *Program plan for fiscal years 1977-1978.* Washington, DC: U.S. Department of Education, February 1977.	Finding out what works in career and vocational education programs is widely cited as a major need in research studies. Many problems related to education and work are probably beyond the influence of education to solve. Unemployment and wages are two instances. When economic conditions are good, job openings and wages usually increase. Education *per se* can do little to influence economic conditions directly.
The Fall 1979 Vocational Education Civil Rights Survey reports the following range of program types and number of students: Secondary & Postsecondary Vocational Enrollment in 126 Occupations = 2 million Cooperative Vocational Education Programs = 329 thousand	*Fall 1979 Vocational Education Civil Rights Survey: National summary by type of school, based on preliminary unedited survey data.* Available from: U.S. Dept. of Education, Office for Civil Rights, Vocational Education Branch, 330 C St., S.W., Washington, DC 20202.	Specific categories available for interpreting vocational education surveys include the following: • American Indian • Asian • Black • Hispanic • White • Total Female Limited English Proficiency and Handicapped Students

Findings	Source	Interpretation
Career and Vocational Education (continued)		
Work Study Programs = 35 thousand Apprentice Training Programs = 30 thousand		
A Department of Labor supported study of Work Experience and Career Exploration Programs attended by nearly 8 thousand teenagers in 576 schools led to the following findings: • Tests of relationship between hours of work and educational performance pointed out that educational benefits increase only up to certain points in work experience and career exploration programs. • One major output of the program was the reduction of school absence and truancy rate and, ultimately, the dropout rate. • In terms of a broad range of work related characteristics, the work study students proved capable of performing at an equal level with more experienced workers.	Stromsdorfer, E.W. *An economic analysis of the work experience and career exploration program.* U.S. Department of Labor, Manpower Administration, Office of Research and Development, Report No. 82-18-71-29-2, July 1973.	The reported interpretation of this finding is that the optimum number of hours of work for students, ages 14 to 15, lies in a range of 2 to 3 hours per day, or 18 hours per week. The educational achievement benefits of work study will reach a maximum, after which benefits will decline and sometimes become negative. Students were paid the same as regular workers in food service, custodial, clerical, general labor, and agricultural jobs. They were rated as positively as adult workers in characteristics such as "takes pride in work."

Findings	Source	Interpretation
Career and Vocational Education (continued)		
Vocational Education Curriculum		
The basic vocational curriculum has not changed until recently. In the 1960s a distinction between vocational and academic education was promoted. Before the 1960s vocational education was limited to instruction in vocational courses.	*Basic skills proficiencies of secondary vocational education students.* Vocational Education Study (Publication No. 4). Washington, DC: U.S. Government Printing Office, 1981 (Order No. 723 253 616).	Recognition of the importance of basic skills to vocational education students grew in the 1960s; as concern with high unemployment among minority groups rose.
The Vocational Education Amendments passed by Congress in 1968 reflected a change in the definition of vocational education. The change may be seen in the following: Vocational Education = remedial or related academic and technical instruction. . . (Public Law 90-576, Sec. 108(1)).		The Vocational Education Act of 1963 and the 1968 Amendments to that measure made major changes in Federal vocational education policy. The legislation sought to increase the responsiveness of vocational education programs to changes in occupations and labor market conditions.
To allow for special training, the 1963 Act broadened the definition of vocational training by also including the following extension: Instruction related to the occupation for which the student is being trained, necessary for him to benefit from such training.	*The Vocational Education Study: The interim report.* Vocational Education Study (Publication No. 3). Washington, DC: U.S. Government Printing Office, 1980 (Order No. 721 413 177).	

Findings	Source	Interpretation
Career and Vocational Education (continued)		
Vocational Education Students		
Research indicates that the typical high school vocational education student reads, writes, and computes at about the same level of proficiency as the student in the general curriculum, but is less well informed than the general curriculum student about several occupations, particularly those requiring a college education.	*Ibid.*	The task of determining the effects of schooling in general, or of vocational education in particular, on students' subsequent attainments is extremely difficult. Many factors other than school curriculum affect the economic and noneconomic experiences of learners after they leave school. The number of methodologically sound studies on the effects of participating in vocational education programs is relatively small.
Research also indicates that the vocational education high school graduate is less likely to be unemployed, especially if the student is black, and is more likely to be in a semiskilled or skilled job than is the general curriculum graduate. The hourly wage and the number of hours worked per week probably will not be very different for graduates of the two curricula.		
The vocational education student will probably express satisfaction with the job. Employers are likely to be satisfied with the students' attitudes toward work and preparation in the job related skills.	*Ibid.*	Some information is available on factors associated with students' dropping out of vocational programs. The 3-year follow-up of one project, for instance, indicated that the agriculture program accounted for the greatest percentage

Findings	Source	Interpretation
Career and Vocational Education (continued)		
The typical high school student in a commercial vocational education program is female. This student reads about as proficiently and writes better than the average student in the general curriculum or in other vocational education programs, but is less proficient in computational skills. The commercial student is less apt to drop out of high school before graduation than a student in the general curriculum. Moreover, in the years following graduation, the typical student is less likely to experience unemployment than the student in the general curriculum.		of dropouts from vocational programs. Another study of dropouts indicated that students were most likely to drop out in the 10th grade. On the whole, more males dropped out than females, and the type of program in which the student was enrolled was not related to his reason for dropping out.
XIII. Learning from work		
The School Years		
In 1978 an extensive study of the learning benefits of out-of-school work experience for 531 10th and 11th graders was begun in California (Greenberger & Steinberg). The high school students who were sampled all were currently working at their first part-time job for at least 3 hours per week.	Greenberger, E., & Steinberg, L.D. *Part-time employment of in-school youth: An assessment of costs and benefits.* Irvine, CA: University of California, Irvine, 1981.	

Findings

Learning from Work (continued)

At the time of data collection members of the study sample were engaged in working on learning a new job in the areas of:

food service (35%); manual labor (15%); retail sales (13%); cleaning (10%); clerical (9%); skilled labor on operatives (6%); recreation aides and ushers (3%); hucksters (3%); child care (2%); newspaper delivery (2%); health aides (1%); and educational aides (1%).

The Greenberger and Steinberg study provides new information concerning the topics of: responsibility; contact with adults; opportunities for learning out of school; and attitudes toward work.

Responsibility

a. Part-time jobs provide some opportunities to exercise and develop personal responsibility.

b. Part-time jobs provide little opportunity to experience cooperation on tasks.

Source

Interpretation

The information gained from the Greenberger and Steinberg study provides new knowledge about the following long held assumptions on the benefits of work during adolescence:

1. out of school work settings provide young people opportunities to learn to take *responsibility;*

2. out of school work settings provide opportunities for young people to maintain *contact with adults* who will serve as teachers, socializers, and friends;

Findings	Source	Interpretation
Learning from Work (continued)		
c. Adolescents spend little time actually assisting other workers in a common task.		3. out of school work settings provide *opportunities for learning* new skills that are not taught in school and for practicing skills previously acquired through formal schooling;
d. The majority of adolescents report they are punctual and fulfill assigned duties, but few report they do more than what is expected.		4. out of school work experience facilitates the development of healthy *attitudes toward work.*
Contact with adults		
Contact with adults in the workplace is limited. Jobs generally fail to put adolescents in touch with adults.		Adolescents receive very little formal instruction from adults.
Opportunities for learning out of school		
a. Working contributes to the acquisition of practical knowledge, business practices, financial concepts, and consumer matters.		Past arguments about the benefits of working for learning new skills on the job and practicing school-taught skills have been overestimated. For many young people the workplace serves more as an extension of adolescent culture than as a bridge to adulthood.
b. Reading, writing and arithmetic computation are infrequent in the jobs typically held by adolescents.		

Findings	Source	Interpretation
Learning from Work (continued)		
Attitudes toward Work		
a. Adolescents describe themselves as better able to persist at a task, resist distraction, and derive pleasure from doing a job well.		Adolescents who work develop an enhanced work orientation.
b. While working diminishes adolescents' involvement in school, and girls (but not boys) become less close to their families, this study did not find evidence that working has negative effects on physical or psychological well-being.		
c. 44 in 100 adolescents believe that the way they do their job affects the well-being of "a lot of people."		
d. Adolescents who work feel better able to be of help to others when they are at work than when they are at school.		
The Years After School		
One approach to answering the question of what is learned through work is to consider the level of literacy demands that occur in different occupations.		Efforts to determine the level of basic educational skills required in different jobs have been hampered by a lack of consensus on the meaning of literacy. Some researchers define functional

Findings	Source	Interpretation
Learning from Work (continued) A pilot study by Mikulecky and Diehl (1979) of 107 workers ranging from unskilled to professional indicated that nearly all workers performed some form of reading and that many job related reading tasks (40%) involved obtaining facts and following directions applicable to the job. 26% of job related reading tasks involved skimming material to make decisions about its use, 23% involved incidental learning of the material as a reference for doing a task, and 11% involved retention of the material through the use of particular strategies such as outlining key points.	Mikulecky, L., & Diehl, W. *Literacy requirements in business and industry*. Bloomington, IN: Indiana University, School of Education, Reading Research Center, 1979.	literacy by using completion of 6th grade or high school as a measure. Others determine functional literacy by attempting to measure adult performance on reading and writing tasks adults may face in their day-to-day lives.

Findings	Source	Interpretation
XIV. Parent-School Relations Characteristics of Successful School-Community Relationships 1. A problem solving orientation of the local school systems. 2. School-community planning is continuous and ongoing. 3. Technical assistance support is continuous. 4. Strong support is available from top-level administration.	Community Education Advisory Council. *Citizen participation handbook: Four case studies #6.* Washington, DC: Office of Education, 1977.	Successful home-school-community involvement occurs in school districts that have identified action-oriented tasks with obtainable results. The school systems had a commitment to attacking problems before a particular need was identified.
Methods Used A variety of paths have been followed in pursuit of an efficient and effective means of gaining parental involvement. Researchers have taken a close look at the effectiveness of methods for training parents in the use of a home based reinforcement system. Parents have been instructed in two 1-hour conferences with a consultant, in one 15-minute conference, and through a 1-page instruction sheet that was mailed to homes. All of the written and verbal instructions delivered through the	Barth, R. Home-based reinforcement of school behavior: A review and analysis. *Review of Educational Research,* 1979, 49(3), 436-458.	It is apparent that parents can learn to administer home-based reinforcement of school behavior with a modicum of instruction. Contact made in groups, individually, via telephone, and through the mails has been demonstrated as successful. It is not apparent from the research literature how long a home-based reinforcement system can be operated by parents and teachers before it degrades, but it is evident that significant changes can be effected before this occurs.

Findings	Source	Interpretation
Parent-School Relations (continued) above methods emphasized the immediate presentation of a reward after the delivery of a deserving note from the child's teacher. Research findings point out that the specific type of parent instruction method for home-based reinforcement of school behavior was not predictive of the amount of behavior change that the children demonstrated. Academic performance improved markedly under all parent instruction methods. When notes were not sent home as frequently after the above experiment began (i.e., during the note reversal stage), the children whose parents had been in the 2-hour training group maintained their gains better than did the children whose parents were instructed by the other methods.		
Impact of Involvement of Parents as Tutors Results of parents' involvement in reading, vocabulary, math, science, and general achievement have been positive.	Ingram, J.E. *Relationships between school-community relations and student achievement.* Madison, WI: University of Wisconsin Research and Development Center for Individualized Schooling, 1978.	A recent review of 10 parent participation programs pointed out that children had positive gains in achievement results in seven programs. Three programs did not find significant gains in general achievement.

Findings	Source	Interpretation
Parent-School Relations (continued)		
Impact of Citizen Participation on Individuals		
When parents show a strong interest in their children's schooling, they promote the development of attitudes key to school achievement. Conversely, children with parents who feel powerless and unimportant and who avoid participating in their education will feel their lives are controlled by others.	*Annotated bibliography on the impact of parent participation on student achievement.* Columbus, MD: The National Committee for Citizens in Education, 1979.	It is not that parent involvement itself directly produces gains in a child's achievement, but rather that involving parents leads them to feel effectual, competent and important, creating an environment that may stimulate and reinforce achievement.
XV. Bilingualism and Bilingual Education		
Proficient bilingualism — speaking and reading in two languages — has been associated with a consistent cognitive and social advantage for the bilingual individual.	Garcia, E.E. *Analysis of linguistic and social interactions in Mexican-American children.* Santa Barbara, CA: University of California, 1980.	With the general shift away from relying only on standardized tests for learning more about individual development, the information processing abilities of bilingual children have received more attention in research.
Public awareness is growing out of the large number of languages that are taught in both public and nonpublic schools in the U.S. Recent directories of schools, which are part of the language resources in the U.S., list at least 50 different languages that are taught to elementary age children.	Fishman, J.A. *Non-English language resources of the United States.* Arlington, VA: National Clearinghouse for Bilingual Education, 1981.	The extent of language resources in the U.S. is demonstrated by the fact that we have 761 periodical publications that are written in 48 languages, and 2,470 TV and radio broadcasting programs in 59 languages.

Findings	Source	Interpretation
Bilingualism and Bilingual Education (continued)		
A primary set of variables associated with the individual's success in speaking and reading two languages is the expectations of parents and teachers of the value of bilingualism and bilingual reading.	Fillmore, L.W., & Tripp, S.E. *Sources of individual differences in second language acquisition.* Berkeley, CA: University of California, 1979.	Past research in second language acquisition suggests that individuals can learn second, third and even fourth languages, provided that they have exposure to the target language in supportive social contexts, and provided they get the help they need from speakers of that language.
Bilingual Development		
Developmental data related to the acquisition of Spanish and English for Spanish-English preschoolers (2-, 3-, 4-, 5- & 6-year olds) is limited. Available information points to the following findings:		Early childhood bilingualism has been defined as the acquisition of two languages during the first 5 years of life.
a. Identifiable stages in which one language forges ahead of the other.	Huerta, A. *The development of codeswitching in a young bilingual.* Working Papers in Sociolinguistics. No. 21. Austin, TX: Southwest Educational Development Laboratory, June 1977.	In general, discussions of bilingual development in the early years include recognition of the child's linguistic abilities in conjunction with the child's social and/or family environment. García (1981) has summarized what is known to date about bilingual development in early childhood:
b. Significant occurrence of well-formed and understandable linguistic utterances were recorded in both languages.		1. The acquisition of more than one language during early childhood can be parallel, but need not be. That is, the qualitative character of one language may lag behind, surge ahead,
c. Regional differences in the occurrence of switched language utter-		

Findings	Source	Interpretation
Bilingualism and Bilingual Education (continued)		
ances have been found in a national study of bilingual children, ages 4, 5, and 6.	Garcia, E. *et al.* Language switching in bilingual children: A national perspective. In E. Garcia & M. Vargas (Eds.), *The Mexican-American child: Language, cognitive and social development.* South Bend, IN: Notre Dame University Press, 1981.	or develop equally with the other language. 2. The acquisition of two languages need not hamper, developmentally, the acquisition of either language.
Beyond the basic developmental research outlined above, a second form of research has considered the interactive influence of multiple language acquisition. That is, does learning more than one language influence the rate and/or quality of acquisition of each language?		
Experimental studies of specific instances of *transfer* or lack of it are available. For instance, monolingual English and bilingual Spanish/English elementary school children were asked to discriminate between words containing English phonemes considered difficult for Spanish speakers. (Examples are the phonemes /b/ and /v/ that are clearly separated in English but not so clearly separate in Spanish).	Garcia, E. *Early childhood bilingualism.* Los Angeles, CA: University of California Press, 1981.	At the present time, there is contradictory evidence on the nature of linguistic transfer, or interference. When referring to the possible interactions that may occur between languages of the bilingual, the terms "linguistic transfer" or "interference" often are used. This latter term has multiple meanings that add to the existence of contradictory evidence.
Results of such studies point out: 1. Bilinguals did not differ from monolinguals on any of the English tasks.		

Findings	Source	Interpretation
Bilingualism and Bilingual Education (continued) 2. Bilinguals scored higher than monolinguals on all Spanish tasks. 3. Negative transfer at the phonological level in young bilingual children is nonexistent. 4. When problems of transfer do arise, the *cause* may be more social in character than linguistic. That is, transfer is affected by social attitudes concerning what language is socially appropriate.		It has been suggested that one direction future research must take, in order to deal with the current contradictory evidence, is to consider the child's surrounding environment in addition to considering the child's linguistic ability. Such analysis would consider the social prestige of the language, and therefore the motivation to learn or maintain a language.
Formal evaluation of bilingual instructional models has remained a difficult task. (See also comments on the section called "Study of Teaching.")	Locks, N.A., Pletcher, B.A., & Reynolds, D.F. *Language assessment instruments for limited-English-speaking students.* Washington, DC: National Institute of Education, October 1978.	Congressionally mandated studies of bilingual education are currently in progress. Results from these studies will be reported to Congress in 1982.
Contradictory research findings have been reported regarding the qualitative nature of bilingual education and instruction.		
Concern over the adequacy of available instruments to assess the academic progress of limited English-speaking students has been voiced in almost every major study or conference on bilingual education during the last several years.		

Findings	Source	Interpretation
XVI. Cross-cultural Considerations		
There is no agreed upon definition of culture in any academic discipline that psychologists can draw on as a means of specifying what it is they mean when they speak of culture as an independent variable that affects individual differences in academic and/or social behavior.	Laboratory of Comparative Human Cognition. What's cultural about cross-cultural cognition? *Annual Review of Psychology*, 1979, 30. Palo Alto, CA: Annual Reviews, Inc., 1979.	One of the quandaries faced by psychologists who are interested in the topic of whether culture enters into the individual's problem-solving and social behavior is to specify independent and dependent variables. The lack of progress in description of culture has been described in the following way:
Reviews of past research have pointed out contradictions in the use of the word "culture." As shown in the following summary, cross-cultural research findings depend in part on the definition of culture that the researcher has adopted for his or her study:	Steward, S. *Nonsense: Aspects of indextuality in folklore.* Baltimore, MD: Johns Hopkins Press, 1978.	One of the quandaries that *unpackaging* of the concept of culture presents (if culture is, as anthropologists tell us, a human-produced, patterned set of experiences) is that we may, by unpackaging, destroy the network of relations that gave the variable its (packaged) meaning in the first place.
Although the origin of the word lies in the Latin *cultura,* the tending of natural growth, current usage has evolved into at least five broad categories: 1. The independent and abstract noun that describes a general process of intellectual, spiritual, and aesthetic development. 2. The independent noun, whether used generally or specifically, which indicates a particular way of life, whether of a people, a period, or a group.		In other words, the problem of disentangling the sociocultural and biological precursors of independent and dependent measures of behavior arise because of insufficient knowledge of the processes responsible for a specific academic and/or social behavior.

Findings

Cross-cultural Considerations (continued)

3. The independent and abstract noun that describes the works and practices of intellectual and especially artistic activities.
4. The idea of culture as classification or arrangement of groups in some relationship to each other.
5. The idea of culture as mutually understood systems of communication. With this definition, members' conversations are considered as culture itself.

Research on cultural variation in cognition has contributed to acceptance of the following general findings:

1. It is essential to demonstrate cause and effect relationships within cultures just as it is essential to demonstrate the relationships between different groups (i.e., families, ethnic groups, economic groups).

2. The existence of culture specific components of cognitive competencies has to be considered little more than a hypothesis rather than a conclusion.

3. A firm understanding of what people are doing, and what their activities

Source

Interpretation

1. Early efforts in understanding the relationship between culture and cognition has slowed, if not halted, the frequent cultural deficit interpretations of group differences in mental ability.

2. While a relationship between social class and acquisition of school skills is well documented, the explanation for this relationship is debated.

3. Group differences can not be viewed as end points of analysis. They become instead the starting point for

Findings	Source	Interpretation
Cross-Cultural Considerations (continued)		
are, is the starting point of analysis. Experiments that are not based on well documented activities and tasks that were observed in everyday contexts are problematic.		an investigation of within group organization of experience.
One of the most replicable findings in cross-cultural studies of school achievement is that children from poor families perform more poorly on school tests than do children from economically advantaged backgrounds. This continued failure to find equal performance scores across economic groups motivated a search for ways to identify and incorporate *cultural* activities and tasks in psychological tests, and psychological experiments.	Piaget, J. Need and significance of cross-cultural studies in genetic psychology. *International Journal of Psychology,* 1966, 1, 3-13. Dasen, P.R. *Introduction to Piagetian psychology.* New York, NY: Gardner, 1977.	At least four general classes of research on culture and cognition have developed since the 1970s. Four sets of factors that are suggested as responsible for cognitive development have been formulated: 1. Biological factors, which interact with the physical environment during growth. 2. *Equilibration* factors, which arise as the young child interacts with his or her immediate physical environment. 3. Social factors of interpersonal coordination, which arise as the child and adult exchange information and the child learns to coordinate his or her behavior with the activities of important others.

Findings	Source	Interpretation
Cross-cultural Considerations (continued)		4. Educational and cultural transmission factors, which are culturally distinct pressures to learn about specific features of the (cultural) environment (as reflected, for example, in different classification or category schemes or labels for behavior).
XVII. Dropouts		
Characteristics of Dropouts		
Though most children from single parent families complete high school, dropping out occurs about twice as often among boys whose parents are separated by death or divorce. Dropping out also occurs more often when family relationships have deteriorated.	Snedeker, B. *Youth knowledge development report: Research on youth employment and employability, youth perspective.* Washington, DC: Department of Labor, May 1980.	What makes the difference is the *quality* of the family environment, not whether or not it is a single parent family.
Family income is positively correlated to a child's academic achievement and high school completion. That is, the more a child's parents earn the more likely it is that the child will complete high school and achieve higher grades. However, kids generally do not drop out *because* of financial need. Instead, the motivation to drop out comes from a variety of personal and school related problems.		

Findings	Source	Interpretation
Dropouts (continued) Students with a long history of low grades and poor academic performance are more likely to drop out. Often, though, prior to dropping out these youth have achieved high grades in courses they liked.		Dropouts do have the capabilities to learn when they choose to apply themselves and if they perceive the curriculum to be suited to their needs.
Dropouts tend to have greater needs for independence. They are more apt to reject group norms and rebel against expectations of authorities. They often know "how to play the game" to be successful in school, but are unwilling to "play along" at the expense of their independence.		
Dropout Attitudes Toward School Many dropouts have a hard time relating to the high school curriculum. Often they appreciate the need to learn basic skills, but they question the relevancy of the high school curriculum beyond the basics. Instead they see the need for more practical courses (i.e., how to balance a checkbook, how to make decisions on their own, how to present themselves in an interview, job skills. . . .)		Alternative (in-school or out-of-school) high school programs should be available to high risk youth. Programs should be varied, offering courses in basic skills and practical school-to-work transition skills. The curriculum should be geared to the needs of the individual. Classes should be small with an emphasis on high student/teacher interaction. These programs should offer an alternative choice for the *potential* dropout. High expectations should be set for student achievement.

Findings	Source	Interpretation
Dropouts (continued) Many dropouts say they would have liked "more teacher interaction" and "more academic pressure." On the other hand, many acknowledge that their own "lack of effort" had a lot to do with their poor academic performance.		
Dropouts tend to place great value on grades as measures of academic achievement. Low achieving youth who *stay* in school do not generally place as much value on grades.		
Most dropouts believe that education is an important factor in getting ahead, but at the time of dropping out, were too alienated or overwhelmed by personal and/or school circumstances to be concerned with the consequences of dropping out. Most believe they will obtain their GED credential or a high school diploma at some time in the future.		
Effects of Dropping Out Dropping out does not *cause* juvenile delinquency, corrupt values, low self-esteem. Generally these youth start school at a disadvantage and these self-defeating behaviors are exacerbated by their school experience.		*Preventive* alternative high school programs should be available to high risk youth.

Findings	Source	Interpretation
Dropouts (continued)		
Few *short-term* differences in measures of job satisfaction and earnings are found between youth that graduate and those that don't. Unemployment is higher among dropouts, but low family SES is a stronger factor in predicting unemployment than the lack of a high school diploma.		
Once out in the world dropouts realize the consequences of dropping out. Often, they will, even after several years, seek out further education, employment and training alternatives.		
Programs		
Programs that use jobs and income incentives to encourage school enrollment and completion have a high success rate.		School/work programs can be effective in getting kids back into public schools or in encouraging them to pursue alternative high school completion programs.

SECTION FIVE
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This sample of studies concerning school-age children and youth was compiled from documents and sources suggested by experts in the Department of Agriculture, the Department of Education, the Department of Health and Human Services, and the Department of Labor:

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