This bibliography cites references dealing with background material on the functions of the human brain and current research on sex differences in brain development. A list of 10 books published since 1974 is followed by a more extensive annotated bibliography of 29 articles, and a bibliography of 19 reports, complete with ERIC reference numbers and instructions for retrieving the documents. Sample forms and instructions for ordering ERIC documents are included. The articles explore such topics as sex differences in cognitive functioning, brain hemispheric differences, cultural differences in information processing, symmetry and perceptual comprehension of children, spatial ability, dyslexia, left- and right-handedness, creativity, and age differences. Many articles focus on research with children and the implications of such research results for educators. (NRB)
SEX DIFFERENCES AND BRAIN DEVELOPMENT:
A BIBLIOGRAPHY

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This publication was prepared by the KNOW-NET Project under a grant from the National Institute of Education (NIE G 80 0021). However, the opinions expressed or materials included do not necessarily reflect policies or endorsement by the National Institute of Education.
INTRODUCTION

Does Johnny's rough and tumble play reflect sexual stereotypes for boys' behavior or does it reflect biologically inherent differences between boys' and girls' brains? A current "hot" topic in psychology, sex differences in brain development is becoming a "hot" topic for educators, too. While it's too early to know how brain research will affect our lives, for educators the findings suggest tantalizing, provocative ideas about how people think, learn and memorize.

This selective bibliography of books, articles and educational documents includes (1) background material on the functions of the human brain and (2) current research on sex differences in brain development.


**ARTICLES**


Eight men and eight women responded "same" or "different" to pairs of geometric figures. Male subjects showed a left visual-field advantage regardless of the level of processing, whereas female subjects did not show a clear-cut hemispheric asymmetry. Results are discussed in terms of sex differences in processing strategies.


Seventy-nine kindergarten and sixth-grade right-handed subjects were administered tasks to infer left-hemisphere and right-hemisphere processing and a measure of field dependence/independence. Results correlating to age and sex are discussed.


The author presents findings from brain hemisphere research indicating a complex dual memory process which separately and simultaneously processes input through visual and verbal encoding strategies. He draws implications from this for educational goals, instructional methods, and student evaluation procedures.


Examines the evidence for sex differences in cognitive functioning, and evaluates the evidence for hormonal, genetic, neuroanatomical, and cultural determinants of such differences. Inadequacies in research methodology are noted.


A study indicating that information processing may be culturally specific and that processing through different brain hemispheres may be a result of how a person perceives his world focuses on the Navajo Tribe and its cultural and behavioral similarities with the Chinese, and compares those groups to Anglo-Americans.

This study of 73 children sought to determine if children's perceptual comprehension of numerals is higher when they are shown symmetrical rather than asymmetrical arrangements of pegs, and if comprehension scores related to age, sex, and/or social class. The main hypothesis was rejected but some age and class differences were found.


Explores (1) problems of the validity of tests of spatial ability, and (2) problems of the recessive gene influence theory of the origin of sex differences in spatial ability. Studies of cognitive strategies in spatial problem solving are suggested as a way to further investigate recessive gene influence.


The review examines issues and research relating to the involvement of the central nervous system in reading disorders. Questions regarding subtypes, pre- and perinatal influences, genetics, sex differences, and early identification are briefly surveyed along with a summary of major research findings in neuropsychology and neurology.


This study explored general relationships between figural creativity, as measured by the Torrance Tests of Creative Thinking, and cerebral dominance, as identified by the conjugate lateral eye movement (CLEM) interview procedure. Subjects were 175 adults. Results indicated no significant differences in figural creativity due to brain dominance type or sex.


The aims of the article are: (1) to outline the general tenets of the "back to basics" movements; (2) to indicate how these tenets go counter to emerging research on hemispheric specialization; and (3) to suggest methods which are brain-compatible and likely to produce competent creative problem solvers.
Because the brains of 12-14 year olds are in a slow-growth period, middle schools should concentrate on developing maturity in existing cognitive skills rather than on introducing new skills.

Skill theory attempts to provide tools for the prediction of developmental sequences in any domain at any point in development. The theory suggests a common framework for integrating developmental analyses of cognitive, social, perceptual/motor skills, and behavioral changes in learning and problem solving.

Results suggested that the right hemisphere becomes progressively more specialized for tactile spatial ability with increasing age.

Researchers are finding evidence that some differences between the sexes—chiefly in spatial and verbal talents—start with differences in the way male and female brains are organized. Other experts challenge the data and warn that they could provide a scientific justification for sexism.

The author reviews some research, particularly that of Roger Sperry, substantiating the existence of different thinking styles in the two brain hemispheres and the development of this differentiation in infancy and childhood. She draws some implications of elementary teaching.

Left-handers with an inverted handwriting posture were compared with other left-handers and with right-handers on a spatial reasoning test. Results were consistent with the hypothesis that left-inverted subjects had relatively bilateral representation of verbal and spatial functions. Bilateral representation is assumed to be inefficient.

Two tachistoscopic tests of cerebral lateralization, one measuring spatial functions and one measuring verbal function, were administered to 73 subjects classified by handedness, hand posture writing, and sex. Tests the proposal that an inverted hand posture is indicative of a language hemisphere ipsilateral to the dominant hand and that the typical, noninverted posture is indicative of the usual contralateral relation.


Research on the relationship of cognitive processes and hemispheric specialization is reviewed. Considered are findings concerning dichotic listening, tachistoscopic image presentation, electroencephalographic responses, conjugate lateral eye movement, and creativity.


Reviews psychometric studies of human spatial ability and studies of environmental, genetic, hormonal, and neurological influences that interact in producing individual variation in spatial test scores.


Proposes that offering students activities that exercise right-brain functions (nonverbal, nonrational, spatial, and intuitive) helps students become more fully developed human beings and better writers.


Article rebuts the theory that "known sex differences in cognitive abilities reflect sex-related differences in physiology".


In a study of attending behavior during the crossover period (12-13 years), when preferences shift from auditory to visual stimuli, females switched their preferences significantly earlier than did males. Besides biological factors, these sex differences were attributed to differential conditioning of attitudes, reinforcement, and discrimination regarding stimulus presentation mode.

This article is adapted from the author's book "The Brain: The Last Frontier," and discusses recent research on the brain that establishes that the brains of boys and girls develop differently and that this affects their learning.


Uses evidence from recent brain research to prove that many behavioral differences between men and women are based on biologically inherent differences in brain functioning.


Reviews some of the recent research on the human brain and discusses the implications of this research for educators.


This study measured test-retest reliabilities and interrelationships of four common measures of lateral dominance: dowel balancing, peg placement, grip strength, and conjugate lateral eye movement. Moderate reliabilities for all measures except grip strength were obtained. Subjects' sex may be an important reliability variable. Correlations among measures were uniformly low.


Results of spatial tests and analytical tasks indicate that girls tend to use the left hemisphere of the brain in processing all the tasks and use it much more so than boys on spatial tasks.


Significant differences were found between younger and older children on most neuropsychological tests. Girls were found to be superior to boys in verbal reasoning, language skills, and serial perceptual matching skills, whereas boys were superior on tests of spatial memory and motor skills.

The central thesis of this study was that maturational rate, or its physiological correlates, influences the development of the organization of higher cortical functions and is therefore an important determinant of sex differences in verbal and spatial abilities.

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