

Project Update: New Network on Adolescent Literacy Funded by Federal Partners

**WASHINGTON, D.C.
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Workshop Summary

WORKSHOP ORGANIZING SPONSORS:

Office of Vocational and Adult Education
Office of Special Education and Rehabilitative Services
U.S. Department of Education

National Institute of Child Health and Human Development, National Institutes of Health
U.S. Department of Health and Human Services

The statements, conclusions, and recommendations contained in this document reflect both individual and collective opinions of the symposium participants and are not intended to represent the official position of the U.S. Department of Education, the U.S. Department of Health and Human Services, or the National Institutes of Health.

Introduction

Background: The National Institute of Child Health and Human Development (NICHD) and the U.S Department of Education's Office of Vocational and Adult Education (OVAE) and Office of Special Education and Rehabilitative Services (OSERS) have had a longstanding interest in the study of literacy and reading disabilities. In particular, while the NICHD has funded both basic and applied research on the reading process, reading disabilities, and intervention trials for reading remediation and effective instruction, OVAE seeks to fund work that will improve the quality and effectiveness of secondary education and support academic achievement of those students who traditionally have been held to lower expectations. OSERS, in recent years, has funded elementary grade reading research, model demonstration and technical assistance and dissemination projects and is highly interested in research activities that will improve services and results for adolescents with disabilities. Many adolescents with disabilities fall behind their peers academically, increasing the likelihood that they will drop out of high school, affecting opportunities for full-time employment adequate to sustain adult living. The research funded under the partnership among these agencies will support them in their broad effort to enhance literacy and employment skills of young American adults.

Two workshops co-sponsored by multiple federal agencies and professional associations held in 2002 focused on the important but under-researched area of adolescent literacy. Individuals appear to have greater difficulty learning to read after nine years of age, but the factors that contribute to or account for this difficulty have not been explained. Researchers know that children who have not developed foundational reading abilities by approximately nine years of age are highly likely to struggle with reading throughout their educational tenure, if not for the rest of their lives, and may never read efficiently enough to acquire information or to enjoy the process. Thus, most of the middle school and high school students who are poor or failing readers could be "left behind" as they continue through school and move into the workplace. This effort seeks to focus both research and educational practice on the "after nine" group -- that is, on striving readers.

Data from the 1998 National Assessment of Educational Progress (NAEP) show not only the often-cited fact that 41 percent of fourth grade boys and 35 percent of fourth grade girls read below the basic level, but also reveal concerning facts about high school youth. For instance, in 8th grade, at a time when all students are expected to be able to acquire information through the reading of textbooks and other materials, 32 percent of boys and 19 percent of girls cannot read at the basic level. In 12th grade, 30 percent of boys and 17 percent of girls cannot read at the basic level. Among Black, Hispanic, and American Indian students, the picture is even more less encouraging: 47 percent of Black, 46 percent of Hispanic, and 39 percent of American Indian 8th graders and 43 percent of Black, 36 percent of Hispanic, and 35 percent of American Indian 12th graders read below the basic level.

Even those adolescents who score at the proficient level require continuing instruction, as they are faced with increasingly complex text to decipher and understand. The 1998

NAEP data also indicated that nearly 60 percent of adolescents can comprehend specific factual information, yet fewer than 5 percent of adolescents were able to extend or elaborate on the meaning of the materials they read. Further, in the 1998 NAEP writing assessment, the data indicated that few adolescents could write effectively with sufficient detail to support main points. Since instruction for adolescents typically focuses on teaching content - science, math, literature, etc. - and does not focus on teaching students how to read and write effectively, students' preparation for advanced study and/or the workforce will be insufficient.

Approximately 1.4 million students drop out of school between grades 9 and 12. Achievement varies among ethnicities and economic classes, with large differences between whites and Latinos and African Americans. A majority of incoming ninth graders in high-poverty urban schools read two to three years below grade level.

Reading disabilities persist over time - they do not go away. Research has indicated that as many as 74 percent of children with early reading disabilities have reading deficits at follow-up several years later. There is also evidence that some successful early readers develop substantial difficulties with reading at older ages. Thus, research illustrates that the long-term implications of low literacy levels among pre-adolescents and adolescents are serious.

Data from international comparisons of 16- to 18-year-olds show that even the top 10 percent in the United States cannot compete with the top 10 percent of 16- to 18-year-olds in other industrialized countries. Many high school graduates enter college unprepared in reading. Approximately 25 percent require remedial reading courses. In community colleges, that number ranges from 40 to 60 percent of freshmen, and 25 percent of these students leave school without graduating. Many drop out because they cannot read well enough to do the course work. About 56 percent of Hispanics, African Americans, and students with disabilities do not finish with a diploma four years after they start.

Research Solicitation

In response to the clear need for both basic and intervention research on the development of higher-level literacy and on reading and writing disabilities during adolescence, the NICHD, OVAE, and OSERS published a research solicitation (HD-03-012, Research in Adolescent Literacy) in the fall of 2002 that encompasses all components of reading, and included interventions in grades 4-12. The focus of the research solicited through this Request for Applications can be summarized in two complex, overarching questions:

1. What characterizes adolescent readers and adolescent striving readers? That is, what are the characteristics of these students, their environments, the contexts in which they receive instruction, and the nature of that instruction with regard to reading and writing during adolescence? What characterizes these students at different developmental levels of literacy? What are the interactions and the reciprocal relationships among these factors?

2. How do the factors that affect the development of literacy change over time? Specifically, how do the characteristics of students, their environments, the contexts in which they receive instruction, and the nature of that instruction with regard to reading and writing during adolescence change and develop over the course of adolescence? This is not a passive model of change. How do adolescents navigate and work through the transitions into and from one level to the next within adolescence? What resources do they access, what literacy practices do they engage in on their own, and what factors affect, mediate, or moderate change?

As a result of this research solicitation, in the fall of 2003, the funding partners are supporting five multidisciplinary research projects (R01) that will be the basis of an Adolescent Literacy Research Network. This Network will be enlarged through additional investigator-initiated grant applications over the next two years.

Projects Funded:

Laurie Cutting, Johns Hopkins University (Kennedy Krieger Institute)¹

Cognitive and Neural Processes in Reading Comprehension

Using both behavioral and neuroimaging methodologies, this study will examine the cognitive and neural processes associated with normal and impaired reading comprehension in 10 - 14-year-olds. It will focus on understanding the contributions of other processes involved in reading comprehension beyond single-word reading. Understanding the behavioral characteristics critical for and the neurological circuits associated with skilled and impaired reading comprehension, as well as their integration, will advance knowledge about poor comprehenders with normal single word reading accuracy scores as well as, in general, processes critical for reading comprehension in children.

Elizabeth Birr Moje, University of Michigan at Ann Arbor

Social and Cultural Influences on Adolescent Development

Using multiple data sources (extant and new data) and mixed methodological techniques, this project will address hypotheses that link expectancy values, motivation, engagement, and literacy achievement across different social and cultural groups.

James McPartland, Johns Hopkins University

Supporting Teachers to Close Adolescent Literacy Gaps

Using experimental methods in a large longitudinal sample, this project will estimate the cumulative impact of a four-year high school intensive literacy program that uses different means of teacher support aimed at students who begin far below grade level.

Hollis Scarborough, Haskins Laboratories

Adolescent Reading Programs: Behavioral and Neural Effects

Using experimental methods, this project will examine the effectiveness of three approaches to reading instruction for striving adolescent readers with differing skill profiles. Pre- and post-intervention fMRI scanning will permit measures of cortical activation during reading to be related to learner characteristics and instructional outcomes.

Bennett Shaywitz, Yale University

Adolescent Literacy: Classification, Mechanism, Outcome

This project will extend previous work in classification, neurobiological, and longitudinal studies of literacy. The investigators will use a prospective longitudinal study design of a large population, well characterized as young school-age children, whom they will assess as adolescent measures include; achievement and processing variables characterizing empirically-derived subtypes of reading disability ; state-of-the-art functional and structural brain imaging methodologies integrated with assessment of neural response to an intervention; and measures of outcomes in multiple domains to address subtypes and to characterize brain-behavior relationships in adolescent striving readers.

Full Investigator Abstracts:

CUTTING: Researchers have established the importance of single word reading to reading comprehension. However, deficits in word reading do not fully explain deficits in reading comprehension, especially for older children, indicating that other sources of comprehension failure need to be investigated. This is particularly illustrated by the existence of a significant number of children (approximately 3%), predominantly ten years of age and older, who are poor comprehenders, but nevertheless attain scores within the normal range on conventional measures of single word reading, which typically measure accuracy only. In this proposal, we will use both behavioral and neuroimaging methodologies to examine the source of comprehension failure for these types of poor readers and, more generally, examine other sources of comprehension failure across reader types / ranges of reading ability. Poor comprehenders who attain normal single word reading accuracy scores may have deficits in reading comprehension because of poor fluency of word reading; poor fluency may result in a "bottleneck" that impedes comprehension. Deficits in other skills, beyond the word-level (i.e., accuracy and fluency of word reading), may also contribute to impaired reading comprehension. Other skills that have been found to influence reading comprehension include vocabulary, syntax, visual and verbal working memory, ability to make inferences, and planning /organization/monitoring, which could be conceptualized as falling within the overlapping domains of language and executive function. In this proposal, we will compare poor comprehenders with normal single word reading accuracy scores to children with traditional reading disabilities (i.e., who have poor single word reading accuracy) as well as to children who are normal readers. We will use functional neuroimaging to examine patterns of activation between these groups during single word reading, working memory for words, and sentence comprehension in conjunction with

behavioral measures of fluency, language, and executive function. Understanding the behavioral characteristics critical for and the neurological circuits associated with skilled and impaired reading comprehension, as well as their integration, will advance knowledge about poor comprehenders with normal single word reading accuracy scores as well as, in general, processes critical for reading comprehension in children.

MOJE: This research plan proposes the use of survey measures, comprehension and writing tests, experimental tasks, and structured qualitative interview and observation techniques to examine the influence of peer, family, community, and cultural factors on the development of literacy skills in both struggling and successful adolescent readers and writers. Survey and qualitative measures will test an expectancy value model that posits a relationship between familiarity of format, contextualization of activity, motivation to engage in an activity, interest in the activity, and literacy achievement. Analyses of survey and qualitative measures will examine across demographic categories (with an emphasis on gender, ethnicity, race, and social class) how peer, family, community, and cultural groups (a) motivate students to develop particular kinds of reading and writing skills and (b) shape students' abilities to navigate different school and social tasks using various reading, writing, and communication strategies.

Comprehension and writing tests will be applied to out-of-school literacy activities to test the hypothesis that adolescents employ proficient and advanced literacy skills as they engage in literacy practices outside of school. In the final year of research, a series of experimental tasks will be used to assess the hypothesis that young people transfer out-of-school literacy practices to their in-school literacy-based activities and vice versa, and to develop possible outlines for classroom-based interventions based on the assessment of transfer across domains. These longitudinal findings will detail (a) the nature and influence of different social groups on adolescent literacy development, (b) the nature and influence of such groups on adolescent motivation related to literacy learning, and (c) the outcomes of such social and cultural influences in terms of adolescents' literacy learning and skill across multiple contexts. These findings will be compiled to produce profiles of the social and school-based literacy development and motivation of various types of adolescents. The profiles will aid in the development of school and social structures and pedagogical approaches targeted at improving adolescents' motivation to engage in conventional literacy activities, thus contributing to their positive mental and emotional health and to their continued school and socioeconomic success beyond K-16 schooling.

McPARTLAND: This project estimates the cumulative impact of a four-year high school intensive literacy program that uses different means of teacher support aimed at students who begin far below grade level. The literacy program builds upon a key component of the Talent Development high school reform model developed at Johns Hopkins University and focuses on reading fluency and comprehension and writing processes for different goals. The program greatly expands the instruction time for literacy and features learning activities such as teacher modeling, focused mini-lessons, cooperative student team discussions, and self-selected reading. Longitudinal samples from nine participating high schools and nine matched control sites will be initiated each year of the study, with two of the five samples eventually covering all four high school grades with estimated

final student samples of 2760 in treatment sites and 2760 in control sites in each case. Support for teachers will be varied in four ways, with an evaluation of one variation each project year of impacts on classroom practice and student achievement gains. Teacher support will vary by specificity and completeness of classroom materials, coverage of subject-specific literacy by English and content teachers, assessments of students for differentiated placements in courses or within-class assignments, and intensity of time and peer-coaching assistance. The significance will be knowledge of how much literacy gaps can be narrowed and closed by intensive interventions with different supports for teachers.

SCARBOROUGH: This project proposes to examine the effectiveness of several research-driven methods for improving the reading abilities of striving adolescent readers. To that end, three approaches to reading instruction, each based on programs with demonstrated success in helping elementary school students, will be compared as interventions for adolescents whose word-reading levels are in the low-intermediate range (corresponding roughly to the reading levels of children in the second through sixth grades). Participants will complete pre-intervention, post-intervention and follow-up behavioral testing and functional magnetic resonance (fMRI) scanning. Initial cognitive and neurobiological profiles as well as relevant changes over time for these students will be compared to untreated adolescents with reading difficulties, younger reading-level matched controls, and age-matched controls. By investigating the cognitive and neurobiological underpinnings of these students' reading difficulties and by identifying effective and efficient methods of intervention for this population, we aim to further the understanding of adolescent literacy in ways that will have important theoretical and practical implications. Specifically, this research aims to (1) describe the cognitive, linguistic, and neurobiological factors that are associated with reading difficulties in adolescence; (2) conduct rigorous, experimental field trials of three promising, research-based instructional programs designed to raise the word reading skills, fluency, and text processing abilities of adolescents with low-intermediate reading levels; (3) to use pre- and post-intervention fMRI to measure cortical activation patterns associated with reading, and to examine the relationships of these measures to behavioral profiles and instructional outcomes; and (4) to examine whether intervention outcomes are related to behavioral and neurobiological differences among adolescent learners. Achieving these aims will not only have great potential benefit for the target population, but will also contribute to our understanding of: (a) the bases for adolescents' reading difficulties; (b) efficient and informative ways to assess the abilities and needs of striving adolescent readers; (c) the similarities between reading problems of adolescents and those of younger children and of low-literate adults, at both the behavioral and neurobiological level; and (d) the consequences of growth in reading for functional brain organization.

SHAYWITZ: Responsive to this RFA, we propose to focus on the discovery of cognitive, behavioral, and neurobiological mechanisms underlying adolescent literacy that can facilitate identification, prevention and remediation of adolescent reading difficulties. Our approach is to extend our previous work and our group's acknowledged strengths in classification, neurobiological, and longitudinal studies of literacy to address the two overarching questions of this RFA: 1. What characterizes adolescent striving readers? and

2. How do factors affecting literacy change over time? Our research strategy uses a prospective longitudinal study design of a large population, well characterized as young school-age children and whom we propose to assess as adolescents; achievement and processing variables characterizing empirically-derived subtypes of reading disability (RD); state-of-the-art functional and structural brain imaging methodologies integrated with assessment of neural response to an intervention; and measures of outcome in multiple domains. We envision this project serving as a pivotal resource to other members of the adolescent literacy network who are more emphasizing intervention studies. In-depth knowledge of the subtypes, their stability over time, neurobiological response to intervention, and determinants of outcome should play a critical role in better understanding, interpreting, and more precisely targeting interventions for specific subgroups of adolescent struggling readers and developing prevention approaches for subgroups of younger struggling readers. Utilization and application of the characterization variables used in this study will allow investigators in the network to probe group- and type-by-treatment interactions and to more precisely determine the efficacy of, and match specific treatments to, specific groups of struggling adolescent readers. The sample, measures and longitudinal framework allow us to address three inter-related specific aims: 1) To identify and determine the temporal stability of subgroups and subtypes of adolescent RD; 2) To characterize brain-behavior relationships in groups and types of adolescent striving readers, brain mechanisms underlying skill, compensation and persistence, and response to intervention in adolescents with RD; and 3) To determine the nature and determinants of outcome in adolescence of childhood RD and the later outcome of adolescent RD.

¹ This project competed as an investigator-initiated project (not under the RFA) and was added to the network upon successful competition and funding.