

Title: The Foundations of Adult Education in Canada

Author: Gordon Selman and Paul Dampier

Publication information: Toronto: Thompson Educational Publishing, Inc., 1990, 310 pages.

Review Author: Maurice C. Taylor

This entry is a review of the book.

Anyone who has ever taught or planned a program for adults, conducted research in this area or had an interest in the nature of the discipline has spent endless hours sorting through the maze of adult education literature looking for Canadian perspectives in this field. Finally, under one cover Selman and Dampier have provided us with a well constructed and amply documented volume that does justice to the lively adult education scene in Canada. The Foundations of Adult Education in Canada is a discussion of the unique characteristics of both the field of practice and the field of study with an emphasis on the most recent decades. As the title suggests, the authors describe the fundamentals of the enterprise - definitions, functions and philosophy, participation, program development, public policy and the contemporary scene. The book provides a rich and insightful explanation of "What is Canadian about Canadian adult education?".

Over the years adult education has been criticized for many things including its lack of precision in definition. Chapter 1 greets this criticism head on by describing the differences between the education of adults and adult education, clarifying the distinctions between related terms and outlining the broad categories pertinent to the organization of content in the field. For practitioners new to this subject, the imagery of the continuum in the section on the relationship of the learner to educational resources provides a foundation for understanding learner autonomy. Early in "Definitions and Boundaries", the authors explain that throughout the volume adult education is discussed on three different dimensions - as a set of activities, as an intellectual process in which adults seek to learn things and as a social system which is made up of individuals and organizations. However, the focus of the book is actually on the activity and social system phenomena.

Deciding how to make a philosophical foundations section inviting and practical to the reader is a challenge to any author. Selman and Dampier fair well on this count. Threaded through chapter 2 are examples of the functions which adult learning performs in the life of individuals in society as well as scenarios which are presented in the context of adult education to help the reader distinguish the philosophical perspectives. Although the two sections of "Functions and Philosophical Considerations" were written by two different pens, together they act as a backdrop for reflection on the practice of adult education. As the authors mention there is no sustained scholarship in these fields which as been produced in English speaking Canada and the section of the chapter on philosophical matters is hopefully the beginning of a new process. For those readers engaged in the terminology debate it may have been useful in this section to refer to the recent attempts to redefine andragogy as opposed to relying solely on Knowles' earlier formulations.

Each page of chapter 3 "The Canadian Movement in Context" colourfully describes the connection between Canada's historical experience as a nation and the form and content of adult education practice. After tracing the British and American influences on adult education in Canada, the authors outline a number of features of the Canadian experience and how outstanding Canadians responded to these challenges as a people by devising educational responses which met not only their own needs but in many instances had useful application abroad. If the message of the chapter is to leave the reader with a sense that adult education is a reactive enterprise the authors have made their point.

One of the central ideas of chapters 4 and 5 relates to the concept of participation in adult learning as a cornerstone in the development of both the field and the discipline. In advancing this argument and promoting the fact that participation must be seen from more than one viewpoint, the authors intertwined the results of the Statistics Canada Adult Education Survey and Tough's efforts at quantifying participation in adult education. Although chapter 4 provides a concise overview of the motivational work of many respected adult educator's such as Verner, Houle, Knowles, Boshier, Cross and Rubenson, there is a mere mention of the methodological shortcomings of their contributions. For a discipline in development such as adult education, this type of

information is crucial for both researchers and front-line workers for the advancement of new knowledge and innovative practice. In chapter 5 the authors creatively sketch out a selection of design elements in actual programs to illustrate how practitioners can learn from a developed program as well as the theoretical conception of program planning. A characteristic common to both chapters is the dynamic and purposeful quality of the adult education enterprise.

To set the stage for understanding the complexities of how governments and other agencies have accomplished national goals through adult education, chapter 6 presents a theoretical orientation to public policy and an analytical framework for policy formation. To help practitioners integrate this information an example of public policy formation favouring adult literacy is used as a case study. Because the case study was so illustrative an additional example may have been warranted. As well, the review section on international calls for public policy may have read better if it had been integrated with the international experiences section of the next chapter. Following the same theme, chapter 7 examines the policy situation within Canada relating to adult education. Specific provincial policies are outlined and prefaced with an insightful set of generalizations about the Canadian situation. This lucid review is based on one method of inquiry - the formal education system. It may have been instructive, as a companion section, to compare this policy situation of the formal education system with another publicly funded institution which provides adult education such as libraries or community centres.

The last three chapters speak to adult education as an emerging profession and field of practice which continues to "be many-faceted with many ideologies and points of view co-existing". A commonly asked question by graduate students seeking professional education in this field is "what can I do with a degree in adult education?". These last chapters address this issue in a very discernible manner. Chapter 8 "Adult Education as Discipline and Vocation" is a factual and tightly written discussion on the roles performed by adult educators, the development of professional associations, the growth of professional education programs and the expansion of research and publication activity. Chapter 9 "The Contemporary Scene and Future Prospects" serves as a summative statement drawing together many of the contemporary developments covered in earlier chapters and chapter 10 "Accessing the Literature" provides an overview of additional references and resources which correspond with the main themes covered in the book. What is missing in this last part of the text is a clear synthesis as to what the authors now view as a Canadian research agenda for the building of new knowledge and advancement of the discipline. Selman and Dampier have adequately described the volume of publications written about the field over the last decades but fall short in providing their informed opinion of the areas which require further rigorous investigation. For eager graduate students in adult education these reference points would have been useful in developing their own research programs.

The Foundations of Adult Education in Canada is a carefully researched and easily read resource book for students, academics, policy makers and persons interested in both observing and participating in the growth and change of a field of practice. It is a volume that fills a long neglected gap in Canadian adult education literature. However, there are three shortcomings in this travail. First, despite the fact that there is much discussion in the book on the instructional process of self directed learning, Selman and Dampier have not illuminated the more recent developments and instrumentation of the personality dimensions of continuing learners and brought us closer to a unified theory of the concept. A second limitation, already addressed by the authors, is that this account of the field does not present the picture of both language communities in Canada. This reader questioned whether adult education in English speaking and French speaking Canada really "functioned in two different worlds". Based on the description of activities and the social system of individuals and organizations in French speaking adult education which are mentioned throughout the volume, there appears to be similitude with English speaking developments as opposed to solitude. And thirdly, sections of the book are repetitious. Having used this text as one of the primary references for a foundational graduate course in adult education, I have found it to be an indispensable tool describing an enterprise which has come of age.

Maurice C. Taylor is an Associate Professor, Faculty of Education, Educational Studies, University of Ottawa.

Title: Locus of Control and Course Completion in Adult Basic Education

Author: Maurice C. Taylor and Marvin W. Boss

Complete text:

Abstract

The relationship between locus of control and course completion in an adult basic education program was investigated. Instruction was individualized; each learner was tutored by an adult volunteer. Early in their program 62 adult learners responded to an 11-item modification of the Rotter I-E Scale. Those learners who completed the program were significantly more internally controlled than those who did not complete the program.

Introduction

Many learners drop out of the adult basic education (ABE) literacy programs prior to gaining necessary reading and writing skills. Drop-out rates of 60% over a 6-month period have been reported (Kent, 1973). Since completion of programs would seem to depend on personal commitment, it is possible that locus of control is related to course completion.

Rotter (1966) states that people vary in the degree to which they recognize a contingent relationship between their own behaviors (actions) and resulting reinforcements (outcomes). Certain people, externals, generally believe that reinforcements are controlled by forces external to themselves such as fate, chance, luck, or powerful others. Others, internals, tend to believe that their own behaviors are the primary factors in receipt of reinforcements. For them, control rests within the power of the individual. Rotter further states that locus of control is a result of the history of reinforcement patterns experienced by an individual.

Because of the type of life experiences of many individuals in ABE programs, it is reasonable to assume that many may see reinforcements as a result of forces external to themselves. It therefore seems possible that completion of ABE programs is directly related to locus of control. There have been few studies of this relationship.

Newsom and Foxworth (1980) hypothesized that a greater percentage of internal as compared to external students would complete a goal. They investigated this relationship among students in ABE classes. Students were enrolled in a federally sponsored retraining program and received training allowances to attend school. In contrast to the hypothesis, the proportions of internals and externals completing the course did not differ significantly. Since receipt of training allowances was conditional on attendance at school one might speculate that this masked any relationship between completion and locus of control.

Tseng (1970) hypothesized that locus of control would correlate with job proficiency, employability, and training satisfaction of clients in a vocational center. He found that in comparison to externals, internals showed significantly higher instructor ratings on job proficiency and personal quality, higher self-ratings on training satisfaction, and higher need for achievement.

In examining the relationship of locus of control and work relevant variables, Valecha (1972) found that white internals were in higher level occupations, made better progress on the job, had more stable work histories, worked more hours per week, and had higher incomes than white externals. No such relationships were found for Blacks.

The above studies had provided some evidence of the relationship between locus of control and variables associated with job success. Although support was not shown for a relationship between locus of control and course completion, it is possible that in the Newsom and Foxworth (1980) study the completion rate was more a function of an outside influence such as monetary allowances for attendance at school than locus of control. Yet, it seems reasonable to expect a relationship between locus of control and course completion. Those individuals who are inclined to associate the receipt of reinforcements as being dependent on their own actions and behaviors should more readily complete a course. Therefore it was hypothesized that adult learners who complete a literacy program are more internally controlled than those adult learners who do not complete.

Method

The participants for this study were 29 female and 33 male adults who enrolled in an ABE literacy program at a community college. This was the total group admitted between September and January. All participants were volunteers, were not eligible for federal training allowances, and could not afford the college tuition fee. The participants learned of the program through social service agency referrals, through word-of-mouth, or through radio and television advertisements. They were told that successful completion would enable them to qualify for further skill training or to enter the job market directly. The students ranged in age from 18 to 56.

Because of the low reading level of the participants, a modification of Valecha's abbreviated 11-item Rotter I-E Scale was used to measure locus of control. These items were chosen based on their adult-oriented and work-related content. In contrast to Valecha's use, the original forced choice format of Rotter's I-E Scale was used. The range of scores was from 0 to 10 with the larger scores indicating external orientation. One filler item was included in the scale. A biographical profile was developed for each student which included type of referral, reading level, age, and progress through the course.

Upon enrolling in the program, each student was interviewed and assigned to one of three reading levels: beginner (decoding words), intermediate (reading to learn), and mature (refinement of skills). Volunteer tutors were recruited through boards of education, university placement centers, a local volunteer bureau, and churches. After being interviewed and trained, a tutor was assigned to work with a specific learner.

The locus of control scale was administered orally by the tutor during the first 2 weeks of the literacy program. Data from six students were not obtained. Of these, four had difficulty understanding the questions, and two tutors did not report the results.

The tutorial program was designed for a 6-month period. Tutors were provided with a literacy curriculum to use in their work with the learners. As a minimum, a 1-hour tutorial was scheduled each week. The learners were provided with materials to use between tutorials.

In order to facilitate the training of tutors and to more adequately administer the program, entry sessions began on three separate occasions: October, December, and January. Because of these time constraints for data collection, completion of the program was defined as active participation in the program for a period of 3 months. It was assumed that students who completed 3 months in the program had shown themselves to be personally committed.

Results

Data were analyzed with two independent variables: completion and reading level (beginner, intermediate, and mature). The means and standard deviations for locus of control scores are presented in Table 1. Those who completed were more internal than those who did not complete. While there was a tendency for beginner readers to be more external than intermediate and mature readers, these differences were not large. Data were analyzed using a two-way analysis of variance (unweighted means) with locus of control scores as the dependent variable. As hypothesized, adult learners who completed the literacy program were significantly

more internal than those who did not complete the program ($F = 17.03$, $df = 1/50$, $p < .001$). It had been expected that those learners who were better readers would be more internally controlled. Although in the hypothesized direction, these differences were not significant. No interaction was found between the two independent variables.

Discussion

Adult learners who completed the program tended to be more internal in their belief of control of reinforcements. Internally controlled individuals are described as likely to believe in their own potential to change their world. Generally speaking, learners who completed the program were able to overcome problems of transportation, weather, conflicting work schedules, and the frustrations of the academic learning. On the other hand, externally controlled individuals generally believe their destinies and outcomes are controlled by forces extrinsic to themselves such as fate, chance, luck, or powerful others. Therefore it is not surprising that those individuals who did not complete tended to be more external.

The 40 learners who completed the program were referred to the program by various methods: 15 from school service agency, 13 from advertisements, and 12 from family members or friends. Of the 16 learners who did not complete the program, 12 were referred by a social service agency, and 4 learned of the program through advertisements. This greater proportion of unsuccessful agency referrals is certainly consistent with what is known of locus of control. The fact that those who did complete tended to be more internal and to participate because of their own decision is consistent with the theory of locus of control.

One basic difference between this study and that of Newsom and Foxworth is that the adult learners who participated in this study did not receive training allowances while those in the Newsom and Foxworth study were federally funded. This may likely account for the difference in results between the two studies. In addition, the completion rate was 71.4% in this study as compared to 57.7% in the Newsom and Foxworth study. While numbers were not large in this study, it indicates a need to investigate the relationship between completion and paid participation.

The I-E construct has been linked to physical and emotional disorders, behavioral problems, job-related attitudes and behaviors, interpersonal relationships, school achievement, and social disadvantage (MacDonald, 1972). If it can be further demonstrated that dropouts in ABE programs have an external orientation, then counselling techniques specific to the adult learn can be designed to increase their feelings of self-efficacy. Shifting adult learners to more internal orientations in a group setting through locus of control change techniques could be conducted as part of the course content in ABE programs. During the program orientation, adult learners with external orientations could be identified and streamed into small groups to be instructed in skills that would help in changing external behaviors and attitudes towards internality.

References

- Kent, W. (1973). Executive summary of a longitudinal evaluation of adult basic education. (ERIC Reproduction Service No. ED 085 418).
- MacDonald, A. P. (1972). Internal-external locus of control change techniques. *Rehabilitation Literature*, 33(2), 44-47.
- Newsom, R., & Foxworth, L. (1980). Locus of control and class completion among adult basic education clients. *Adult Literacy and Basic Education*, 4, 41-49.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1, Whole No. 609).
- Tseng, M. S. (1970). Locus of control as a determinant of job proficiency, employability and training satisfaction of vocational rehabilitation clients. *Journal of Counselling Psychology*, 17, 487-491.
- Valecha, G. K. (1972). Construct validation of internal-external locus of reinforcement related to work-related variables. *Proceedings of the 80th Annual Convention of the American Psychological Association*, 7, 455-457.

Title: Draft White Paper Released

Organization: Alberta Advanced Education and Career Development

Form of Material: Press Release

Publication Information: March 30, 1994

Complete text:

Edmonton.....A draft White Paper outlining an Agenda For Change to Alberta's public adult learning system is now available for public review. The draft is the next stage in the Adult Learning: Access Through Innovation initiative announced by Jack Ady last Fall.

"Everyone who expressed an interest in our public consultation process last year will receive a copy of the draft White Paper in the mail," Mr. Ady stated. "The paper proposes a bold, new vision for the renewal of the province's adult learning system to the year 2005. The mission, goals and strategies in this draft White Paper are consistent with the outcomes of the first round of public consultations and the budget roundtable that were held last year and the business plan that we announced last month." Ady then added, "We are getting closer to defining a new future for adult learning and I am looking forward to the debate during the round two of our public consultation."

Each copy of the draft paper will contain a questionnaire response from so that every interested Albertan can provide input. In addition, a second round of consultation will be held with more than 300 stakeholders including both those who deliver education and training services and those who receive them. Two meetings will be held with approximately 150 people attending each one: May 2-3, 1994, at the Edmonton Inn in Edmonton and May 5-6, 1994, at the Sandman Inn in Calgary.

The draft White Paper sets four goals for the future of adult learning in Alberta: to foster individual responsibility in a learner-centered system, to ensure responsiveness and accountability to learners and taxpayers, to enable Albertans to participate in a changing economy and work force, and to promote access to affordable, quality learning opportunities. The paper then goes on to suggest 24 strategies to reach those goals.

The deadline for receipt of written responses is May 11, 1994. Copies of the draft White Paper can be obtained by calling 1-800-463-4597. In Edmonton call 420-1162. The deaf or hard of hearing should call (TTY-TDD) 1-800-855-1155. In Edmonton call 429-4900.

For more information:

Jack W. Ady

Minister

Advanced Education and Career

Development

(403) 427-2291

Bob Dawson

Executive Assistant to the Minister

Advanced Education and Career

Development

(403) 427-2291

TABLE OF CONTENTS

I Background

II A New Vision for Adult Learning in Alberta

III Changing Roles in a Renewed Adult Learning System

IV Goals

1. Foster individual responsibility in a learner-centred system
2. Ensure responsiveness and accountability to learners and taxpayers
3. Enable Albertans to participate in a changing economy and work force
4. Promote accessibility to affordable, quality learning opportunities

V Strategies: An Agenda for Change

GOAL 1: Foster individual responsibility in a learner-centred system

1. Improve information and counselling services
2. Revise tuition fee policy
3. Rationalize student financial support

GOAL 2: Ensure responsiveness and accountability to learners and taxpayers

1. Establish an Adult Learning Forum
2. Improve arrangements for transfer and recognition of prior learning
3. Coordinate application systems
4. Establish an accountability framework
5. Remove barriers to responsiveness in programming

GOAL 3: Enable Albertans to participate in a changing economy and work force

1. Focus on programs that address the needs of the economy
2. Emphasize employment preparation initiatives for the disadvantaged
3. Develop alternative routes to labour market entry
4. Promote more employer-based training

GOAL 4: Promote accessibility to affordable, quality learning opportunities

1. Clarify the roles within the publicly funded adult learning system
2. Establish an Access Fund
3. Respond to future demand
4. Implement a new funding formula for publicly funded post-secondary education
5. Consider changes to labour relations for post-secondary institutions
6. Develop appropriate standards
7. Develop centres of program specialization
8. Expand the use of educational technologies and alternate forms of program delivery

VI Your Opportunity to Respond

I. BACKGROUND

Learning is fundamental to the economic prosperity and social well-being of Albertans. Learning is the means by which we can identify and benefit from the opportunities made possible through change. It also enriches our lives by providing us with knowledge to better understand and respond to our world.

Adult learning in Alberta is at a crossroads. Our adult learning system includes publicly funded post-secondary institutions, community-based learning providers, apprenticeship and other industry-based training programs, private colleges and vocational schools. The system has served us well. However, we have reached a point where it must change fundamentally from what it has been in the past, so that Albertans can grasp the opportunities of the future.

This draft White Paper proposes a strategic plan for the transformation of Alberta's adult learning system. It describes a new vision for adult learning in Alberta and outlines the goals that must be met to realize that vision. The paper details the strategies proposed by Alberta Advanced Education and Career Development to achieve these goals.

This draft White Paper is put before Albertans for discussion and comment. The responses and advice from learners, taxpayers, business and industry, institutional board members, administrators and faculty, and other stakeholders will help define the department's policy framework for adult learning in Alberta. This will be outlined in a White Paper, along with clear indications of how the department intends to measure progress towards achievement of its goals.

Access through Innovation: A Strategic Planning Process

The ideas proposed in this document emerged from the department's consultation with Albertans, entitled *Adult Learning: Access Through Innovation*. It is part of a strategic planning process implemented by Advanced Education and Career Development in the fall of 1992 in response to a number of trends that are affecting adult learning in the province. These trends include:

- * Increasing numbers of learners - Due to the "echo baby boom", the number of high school students will increase over the next 10 years. This factor, combined with the recent trend for an increasing proportion of high school graduates to seek post-secondary learning, leads to a forecast of more adult learners.
- * Changing characteristics of learners - Immigration patterns, an aging population, and greater participation in the labour market by women, aboriginal Albertans, disabled persons and others who have been under-represented in the past, require the adult learning system to respond to a wider range of social, cultural and economic needs.
- * Changing economy - Economic restructuring, technological change and increased global competition are changing the labour market and the skills required for employment. This is resulting in more adults of all ages seeking more and different types of education, training and re-training.
- * Shift in emphasis of income support programs - Support for education, training and re-training, with the aim of increasing individual self-sufficiency and reducing dependency on social support systems, is a priority both provincially and nationally.
- * Changing nature of educational program delivery - Alternative forms of program delivery are becoming more widely available through the use of advanced technology. There is also an increasing involvement by private providers of education and training services, and a recognition of the importance of learning opportunities offered through on-the-job training.

* Increasing pressure on resources - The budget for Advanced Education and Career Development will decrease by 15.8% over the next three years. This will directly affect publicly funded learning providers.

The first round of public consultation meetings took place in centres throughout Alberta during the fall of 1993. Albertans expressed their views on the challenges before us and how they might be confronted. During these consultations, people spoke about:

- * the significance of education to the social, intellectual and economic life of Albertans and their communities;
- * the importance of adult learning to the development of a skilled work force;
- * coordination in the system of adult learning, including the problems of transferability within the system;
- * the challenges to public institutions;
- * institutional funding and student finance; and
- * the roles of individuals, institutions, industry and government.

In addition to the public consultation process, the department engaged in a series of budget discussions on the development of its three-year business plan. In July 1993 a workshop was held with representatives of post-secondary institutions to discuss the 1994-95 budget. In November a budget roundtable was held, bringing together a broad range of stakeholders representing both the deliverers and recipients of educational services to discuss strategies that would contribute to the government's goal of deficit reduction.

The department's three-year business plan was released in February 1994. The responses to this draft White Paper will influence future business plans.

The public's involvement in this consultation process to date has been considerable. Albertans have made it clear what is important to them in the area of adult learning. This draft White Paper is the department's response to the messages and ideas we have heard.

Further public consultation meetings will be held in May 1994 to obtain response to the proposed strategies outlined in this draft White Paper.

A policy framework for university research

This draft White Paper does not deal specifically with the topic of university research. During public consultation, the role of university research was confirmed as a vital, important part of Alberta's learning system and the province's economy. Universities play a key role in developing and applying new knowledge. Among the issues that deserve further discussion are the contribution of research to the economic goals of the province, and its role in graduate education, training highly qualified people and the transfer of technology. Within the coming year, the department will be a lead partner in a separate consultation with key stakeholders to develop a policy framework for university research.

II. A NEW VISION FOR ADULT LEARNING IN ALBERTA

In response to what we have heard from Albertans, we see a new vision for adult learning in Alberta.

In the year 2005, Alberta's adult learners will be recognized for the excellence of their knowledge, skills, attitudes and experiences that enable them to

- * take responsibility for shaping their futures,
- * participate in a changing economy and work force, and
- * enrich the quality of life in their communities.

Alberta's adult learners will achieve excellence by participating in high quality, life-long learning opportunities.

The vision focuses on Albertans as active learners.

With the focus on learners and their needs, certain expectations of those who provide learning opportunities become apparent. In the context of this vision, the mission of the department will be as follows:

Advanced Education and Career Development will lead and work with other partners in facilitating new directions for adult learning that ensure for learners and taxpayers an accessible, responsive and affordable system of adult learning that is accountable for results.

The vision and strategies in this document set new directions for the future of adult learning in Alberta. In a system oriented toward adult learners, learners will take more responsibility for their learning, encouraging providers to be more responsive to and accountable for addressing their needs.

A renewed adult learning system will be characterized by the following features:

- * Quality is a priority.
- * Individual responsibility is the key to independent learning.
- * The system is driven by responsiveness to learner needs.
- * Albertans' knowledge and skill requirements in a global economy are continually being met.
- * Access is available to quality learning opportunities, in the classroom, at home and on the job.
- * Learning technologies are effective components of the learning system.
- * Scholarship and research create new knowledge.
- * On-the-job education and training are integral to the system.
- * Learners' progress is improved by the ability to transfer program credits and recognition of prior learning and experience.
- * Grants to institutions encourage and reward productivity and quality performance.
- * Public expenditures are cost-effective.
- * Learning providers and the department are accountable for results.

Alberta will be known for the quality and affordability of its adult learning system.

III. CHANGING ROLES IN THE RENEWED ADULT LEARNING SYSTEM

A renewed system of adult learning will be made possible through the commitment and effort of all who are concerned and involved in adult learning. The strategies outlined in this document will produce fundamental change in the roles, functions and activities of all stakeholders in the system.

Active Learners

As the focal point in the adult learning system, learners will have a substantially greater role to play, as well as greater responsibility. Learning providers will share performance indicators with students to support more informed choice among learners. Access to learning opportunities will be maximized in response to demand. The learning outcomes and success of students will play an important part in the institutional funding system. Student finance services will ensure learners are not denied access to educational opportunities on the basis of financial need.

Learners will have a greater individual responsibility for educational choices and progress. As well, students will be expected to contribute a greater proportion of the costs of their education, in accordance with the benefits they receive.

Providers

Learning providers, both public and private, will be more accountable to students and taxpayers for the expenditure of public resources. They will be evaluated on the basis of results achieved. Publicly funded institutions will work together to maximize access on a province-wide basis. New, effective education technologies will be encouraged to improve access and productivity on campus and at a distance.

Learning providers will be more responsive to the needs of individual, community and the economy. They will solicit information from industry about the needs of the labour market and encourage employers to play a greater role in program design. There will be more emphasis on non-public revenue sources. Linkages between institutions will be improved to enhance students' ability to transfer between programs. Where appropriate, private learning providers will be accredited so that they may play an expanded role in the adult learning system.

Communities

Communities will play an active role in defining local learning needs and priorities and communicating these needs to education and training providers. As well, communities will continue to play a strong role in the delivery of learning opportunities on a local basis, both on their own and in partnership with other educational providers.

Business and Industry

Business and industry is a broad categorization which includes employers, employees, and professional and trade organizations. They will play an expanded role by becoming active participants in the adult learning system. They will have an enhanced role in providing advice to the system both in terms of overall direction and specific program design. Employers will take a greater role in job-specific training. Industry will also be expected to contribute more to the costs of education and training.

Government

In consultation with Albertans, government will take an active leadership role in setting policy and direction for the system of adult learning in Alberta. Expectations for the adult learning system will be defined, benchmarks established, and key performance measures published to ensure learners are able to make educational, career and financial decisions on the basis of informed choice. The government will retain its role of consumer protection. However, the department will move away from the current system of program approval towards a broader system of provider accountability.

Government funding (that is, taxpayer support) is provided to adult learning because learning opportunities provide benefits to society as a whole which are broader than the benefits that accrue to the individual. Public funding will continue to support those areas where broad public benefits are demonstrated. Systems of accountability and funding will ensure the taxpayer investment in adult learning supports the highest possible quality for the amount invested. Government student finance assistance will ensure access that to learning opportunities is not denied to qualified and motivated Albertans on the basis of financial need.

IV. GOALS

In order to realize the vision for adult learning in Alberta, four goals have been identified:

- * Foster individual responsibility in a learner-centred system.
- * Ensure responsiveness and accountability to learners and taxpayers.
- * Enable Albertans to participate in a changing economy and work force.
- * Promote access to affordable, quality learning opportunities.

Goal 1: Foster individual responsibility in a learner-centred system

We heard during Round One of our public consultation that Albertans want a learner-driven adult learning system. Individual Albertans expect the adult learning system to offer them opportunities that are relevant to their learning needs, enable them to pursue lifelong learning, and prepare them with the necessary skills and knowledge to participate fully in the economy and society. Adult learners recognize they must take greater responsibility both for their learning outcomes and the cost of their education, in line with their needs, abilities and anticipated future benefits. A focus on learners is vital to ensuring the results achieved in the adult learning system meet the objectives of those it serves.

Goal 2: Ensure responsiveness and accountability to learners and taxpayers

Alberta's adult learning system is being challenged to do more. Throughout Round One of our public consultation, Albertans told us the adult learning system must be more responsive to the labour market, to the differing needs of communities and to the changing social and economic environment. In addition, Albertans want the system to be more accountable to its users, with a focus on measuring program outcomes/results. Learners, taxpayers, and employers want assurances that adult learning programs and institutions are meeting their objectives. Key performance measures need to be defined and communicated to the public so learners can make informed choices. Finally, Albertans told us that methods to recognize prior learning and allow for the transfer of credit within the adult learning system must be improved in order to promote learning throughout life.

Goal 3: Enable Albertans to participate in a changing economy and work force

Economic restructuring, technological change and increased global competition are resulting in changes in the labour market and in the nature of employment. The overall effect of the changes has been a gradual upgrading of the skill requirements in the labour market. Creativity and general reasoning and thinking skills are also becoming increasingly important. General education and specific skill training are linked to Alberta's economic competitiveness.

In addition, a fundamental shift in our social support programs from passive income support to support for education and training is placing increased demands on our adult learning system to prepare people for employment. Social policy is undergoing reform, both provincially and nationally. There is a need to clarify federal and provincial roles, coordinate policy and remove duplication of services.

A consistent theme heard during public consultation was the need for more involvement of business and industry in education and training. There was also a message that a stronger focus was required toward meeting labour market needs. Effective partnerships among learners, education and training providers, industry, and the community are seen as the key to meeting these needs.

Goal 4: Promote accessibility to affordable, quality learning opportunities

The adult learning system must respond to the increased demand for learning opportunities at a cost that is within the ability of taxpayers and learners to pay. Funding arrangements that are linked to standards and results will be a key force in encouraging the innovation and program delivery changes that are necessary to meet this goal. The ways public resources are allocated should encourage effectiveness and productivity.

More than three-quarters of the revenue currently received by publicly funded post-secondary institutions is in the form of government grants. The current funding system presumes that dollars will drive quality. However, as comparisons with other jurisdictions indicate, the link between funding and quality is not direct. With the reduction in provincial operating grants to publicly funded institutions, there is an urgent need to improve the effectiveness of the use of public funding.

Title: unclear (report of research project 1991, 1992 on "What happens when some women in a literacy program decide to do something they consider woman-positive?")

Organization: Canadian Congress for Learning Opportunities for Women (CCLOW)

Publication information: and funded by the National Literacy Secretariat, Human Resources Development

This entry is a description of the research project and its findings.

Do you want to know what happens when some women from 12 very different literacy programs decide to do something woman-positive?

Women across Canada participated in an unprecedented research project during 1991 and 1992. Two women from each of twelve adult literacy and basic education programs asked themselves, "What happens when some women in a literacy program decide to do something they consider woman-positive?" The results were surprising and often far-reaching.

The research--sponsored by the Canadian Congress for Learning Opportunities for Women (CCLOW) and funded by the National Literacy Secretariat, Human Resources Development - - started from women's everyday experience in adult literacy programs. From the exploratory research for this project, we already knew that women face barriers when they attempt to participate in literacy education. Most programs do not meet the needs of women; particularly women marginalized by poverty, race, rural location, relationship to children, disabilities, immigration status, sexual orientation, and source of income. Different women in different programs at different times have tried to do literacy work in ways that are positive for women. Sometimes these attempts have worked and sometimes they haven't, but nowhere was there a description or analysis of why things happened the way they did. We also knew that women face resistance when they engage in woman-positive activities, activities designed specifically for women.

This research project started from the insights gained in the exploratory phase and built on the knowledge brought by the thirty-two women who became involved. With the support and resources of a national research project and other women from across the country, they planned and implemented woman-positive activities in their programs. Over a twelve-month period they observed, discussed, and interpreted the personal, professional, political, and structural consequences of these activities. They reflected on individual and group dynamics within their own lives, their workplaces, and their communities. They interpreted both the different forms of resistance they encountered and the positive changes in program policies they facilitated. They developed a collaborative analysis and series of recommendations based on these observations, discussions, reflections, and interpretations. And they documented every step of the way.

This research project did not set out to increase students' reading or writing levels or to improve their grade standings--although those things happened. It did not set out to empower women in literacy--although that happened. It did not set out to encourage feminist analysis-- although that happened. It did not even set out to help programs become more woman- positive--although that also happened.

Instead, this research focused on what actually happened when a group of women looked at how adult literacy and basic education programs across Canada fail to pay attention to the realities of women's lives. In the process they engaged in effective literacy work, empowered many women (including themselves), challenged and affirmed feminist analyses, and helped a wide variety of programs become more woman-positive. Together, this group of women have documented their work so that those involved in adult literacy, non-profit agencies, education institutions, coalitions, and policy development can pay attention to the lives of women and other marginalized groups.

There is a distinct and different context for each of the twelve programs in this research. They provide services in large urban centres and in the urban/rural mix of prairie and northern towns and cities. They are on the east and west coasts, on the Hudson Bay, and Lake Ontario. Four programs are located in community colleges, a fifth is based in a federation of labour, a sixth in a prison. The remaining six community-based programs operate in a range of locations; on the street, in store-fronts, in public housing, in a Native friendship centre, and in a community centre.

These programs have a variety of mandates and organizational structures. Some of the programs included women-only groups. Others had never before considered working with women as a particular student group. The students in these programs ranged from those involved in basic literacy to those preparing to write their high school equivalency exams. Their involvement in the decision-making processes of their programs varied widely.

The women who acted as researchers also varied. With two early exceptions, they all worked as staff or volunteers in their programs. Several had been learners in those or other programs before becoming staff. They ranged in age from 23 to 56, in academic background from less than grade 12 to postgraduate degrees, and in experience from one to twenty years.

The research process

In November of 1991 women from each of the twelve adult literacy and basic education programs met at a retreat centre north of Winnipeg to learn about research and begin planning their involvement in this research project. Over the eighteen months of this phase of the research thirty-two women participated in some way. In most cases, two women became the on-site researchers for their program. They shared responsibility for planning and reflecting on a woman-positive activity for their program. In several programs, one woman took primary responsibility for implementing and documenting the activity and its effects on the program. The other woman acted as a support for her co-worker, attending the three national workshops and participating in two interviews. Francis Ennis joined Betty-Ann as a coordinating researcher after the first national workshop.

CLOW paid the two contact women from each program a total of one-half day a week to "research" their woman-positive activity and its consequences for staff, students, and the program as a whole. They spent that time reflecting alone and with others, writing journals they sent to the coordinating researchers, and developing documentation of their work. The personal, professional, political, and structural changes that happened over this year demonstrate the positive effects of providing adult literacy workers--perhaps any frontline workers--with time, support and resources to reflect critically and creatively on their practice and the practice of others on their field.

These women spent twelve months initiating, observing, and documenting the impact of the woman-positive activity chosen for their program. During that year, they were visited twice by Betty-Ann or Frances. During these visits, they took part in two in-depth interviews designed to encourage interpretation and analysis of what was happening with themselves, with other staff, and with students.

The contact women from each program also attended two additional workshops. At the second workshop, held in Mississauga in April 1992, the women raised many of the issues that had arisen in their programs over the last six months and discussed different ways of documenting their activity. The final workshop took place in November 1992 in Ottawa. At this workshop women developed a collaborative analysis of their experiences and put together recommendations for programs, policy-makers, and funders. The recommendations form a vision of a woman-positive future in adult literacy.

This research was ground-breaking in a variety of ways

This research did not set out to prove any hypothesis. The women involved did not initiate their activities to prove a particular point. They simply wanted to do something that they thought would be positive for some of the women in their programs. They wanted to use this research opportunity to improve the programs in which they worked. They also wanted to share their experience with others by analyzing what happened on several levels. They explored the personal, professional, political, and structural consequences of their activities. They participated in research that was ground-breaking in a variety of ways.

- * The research made visible women's experiences in a variety of literacy programs in different parts of Canada. It raised questions about how women's lives and needs are or are not taken into account in these programs. It demonstrated how funding policies contribute to the ways in which programs ignore the reality of women's lives.
- * The research emphasized the difficulties faced by those who ask for attention to be paid to members of marginalized groups. Several women confronted personal and professional risks in starting their woman-positive activities. Others had to deal with ignorance, ongoing passive resistance, and persistent apathy. The research gave women the support to continue despite these obstacles.
- * The research allowed some literacy workers time to reflect on their work, to find support from others, and to analyze their common and diverse experiences. It provided extraordinary professional development.
- * The research highlighted the lack of information about literacy workers in Canada. Although we know that most adult literacy workers are women, we became increasingly curious about how that fact related to the lack of funding and status for literacy. The research helped the women involved become more aware of their need to take care of themselves.
- * The research design and methodology provides a model for program-based action research that begins with frontline workers' living experiences, involves them in collecting data, analyzing information, and developing solutions to identified problems.

(Lloyd with Ennis & Atkinson (Eds.), 1994, pp. XX-XX; Lloyd with Ennis Atkinson, 1994, pp. XX-XX)

Title: Adult Literacy in America

Organization: U.S. Department of Education, Office of Educational Research and Improvement
National Center for Education Statistics
Publication information: December 1993
This entry is a description of the project.

This report provides a first look at the results of the National Adult Literacy Survey, a project funded by the U.S. Department of Education and administered by Educational Testing Service, in collaboration with Westat, Inc. It provides the most detailed portrait that has ever been available on the condition of literacy in this nation--and on the unrealized potential of its citizens.

Many past studies of adult literacy have tried to count the number of "illiterates" in this nation, thereby treating literacy as a condition that individuals either do or do not have. We believe that such efforts are inherently arbitrary and misleading. They are also damaging, in that they fail to acknowledge both the complexity of the literacy problem and the range of solutions needed to address it.

The National Adult Literacy Survey (NALS) is based on a different definition of literacy, and therefore follows a different approach to measuring it. The aim of this survey is to profile the English literacy of adults in the United States based on their performance across a wide array of tasks that reflect the types of materials and demands they encounter in their daily lives.

To gather the information on adults' literacy skills, trained staff interviewed nearly 13,600 individuals aged 16 and older during the first eight months of 1992. These participants had been randomly selected to represent the adult population in the country as a whole. In addition, about 1,000 adults were surveyed in each of 12 states that chose to participate in a special study designed to provide state-level results that are comparable to the national data. Finally, some 1,100 inmates from 80 federal and state prisons were interviewed to gather information on the proficiencies of the prison population. In total, over 26,000 adults were surveyed.

Each survey participant was asked to spend approximately an hour responding to a series of diverse literacy tasks as well as questions about his or her demographic characteristics, educational background, reading practices, and other areas related to literacy. Based on their responses to the survey tasks, adults received proficiency scores along three scales which reflect varying degrees of skill in prose, document, and quantitative literacy. The scales are powerful tools which make it possible to explore the proportions of adults in various subpopulations of interest who demonstrated successive levels of performance.

This report describes the types and levels of literacy skills demonstrated by adults in this country and analyzes the variation in skills across major subgroups in the population. It also explores connections between literacy skills and social and economic variables such as voting, economic status, weeks worked, and earnings. Some of the major findings are highlighted here.

THE LITERACY SKILLS OF AMERICA'S ADULTS

o Twenty-one to 23 percent--or some 40 to 44 million of the 191 million adults in this country--demonstrated skills in the lowest level of prose, document, and quantitative proficiencies (Level 1). Though all adults in this level displayed limited skills, their characteristics are diverse. Many adults in this level performed simple, routine tasks involving brief and uncomplicated texts and documents. For example, they were able to total an entry on a deposit slip, locate the time or place of a meeting on a form, and identify a piece of specific information in a brief news article. Others were unable to perform these types of tasks, and some had such limited skills that they were unable to respond to much of the survey.

o Many factors help to explain why so many adults demonstrated English literacy skills in the lowest proficiency level defined (Level 1). Twenty-five percent of the respondents who performed in this level were immigrants who may have been just learning to speak English. Nearly two-thirds of those in Level 1 (62 percent) had terminated their education before completing high school. A third were age 65 or older, and 26 percent had physical, mental, or health conditions that kept them from participating fully in work, school, housework, or other activities. Nineteen percent of the respondents in Level 1 reported having visual difficulties that affect their ability to read print.

o Some 25 to 28 percent of the respondents, representing about 50 million adults nationwide, demonstrated skills in the next higher level of proficiency (Level 2) on each of the literacy scales. While their skills were more varied than those of individuals performing in Level 1, their repertoire was still quite limited. They were generally able to locate information in text, to make low-level inferences using printed materials, and to integrate easily identifiable pieces of information. Further, they demonstrated the ability to perform quantitative tasks that involve a single operation where the numbers are either stated or can be easily found in text. For example, adults in this level were able to calculate the total cost of a purchase or determine the difference in price between two items. They could also locate a particular intersection on a street map and enter background information on a simple form.

o Individuals in Levels 1 and 2 were much less likely to respond correctly to the more challenging literacy tasks in the assessment--those requiring higher level reading and problem-solving skills. In particular, they were apt to experience considerable difficulty in performing tasks that required them to integrate or synthesize information from complex or lengthy texts or to perform quantitative tasks that involved two or more sequential operations and in which the individual had to set up the problem.

o The approximately 90 million adults who performed in Levels 1 and 2 did not necessarily perceive themselves as being "at risk." Across the literacy scales, 66 to 75 percent of the adults in the lowest level and 93 to 97 percent in the second lowest level described themselves as being able to read or write English "well" or "very well." Moreover, only 14 to 25 percent of the adults in Level 1 and 4 to 12 percent in Level 2 said they get a lot of help from family members or friends with everyday prose, document, and quantitative literacy tasks. It is therefore possible that their skills, while limited, allow them to meet some or most of their personal and occupational literacy needs.

o Nearly one-third of the survey participants, or about 61 million adults nationwide, demonstrated performance in Level 3 on each of the literacy scales. Respondents performing in this level on the prose and document scales were able to integrate information from relatively long or dense text or from documents. Those in the third level on the quantitative scale were able to determine the appropriate arithmetic operation based on information contained in the directive, and to identify the quantities needed to perform that operation.

o Eighteen to 21 percent of the respondents, or 34 to 40 million adults, performed in the two highest levels of prose, document, and quantitative literacy (Levels 4 and 5). These adults demonstrated proficiencies associated with the most challenging tasks in this assessment, many of which involved long and complex documents and text passages.

o The literacy proficiencies of young adults assessed in 1992 were somewhat lower, on average, than the proficiencies of young adults who participated in a 1985 literacy survey. NALS participants aged 21 to 25 had average prose, document, and quantitative scores that were 11 to 14 points lower than the scores of 21- to 25-year-olds assessed in 1985. Although other factors may also be involved, these performance discrepancies are probably due in large part to changes in the demographic composition of the population--in particular, the dramatic increase in the percentages of young Hispanic adults, many of whom were born in other countries and are learning English as a second language.

o Adults with relatively few years of education were more likely to perform in the lower literacy levels than those who completed high school or received some type of postsecondary education. For example, on each of the three literacy scales, some 75 to 80 percent of adults with 0 to 8 years of education are in Level 1, while fewer than 1 percent are in Levels 4 and 5. In contrast, among adults with a high school diploma, 16 to 20 percent are in the lowest level on each scale, while 10 to 13 percent are in the two highest levels. Only 4 percent of adults with four year college degrees are in Level 1; 44 to 50 percent are in the two highest levels.

o Older adults were more likely than middle-aged and younger adults to demonstrate limited literacy skills. For example, adults over the age of 65 have average literacy scores that range from 56 to 61 points (or more than one level) below those of adults 40 to 54 years of age. Adults aged 55 to 64 scored, on average, between middle-aged adults and those 65 years and older. These differences can be explained in part by the fact that older adults tend to have completed fewer years of schooling than adults in the younger age groups.

o Black, American Indian/Alaskan Native, Hispanic, and Asian/Pacific Islander adults were more likely than White adults to perform in the lowest two literacy levels. These performance differences are affected by many factors. For example, with the exception of Asian/Pacific Islander adults, individuals in these groups tended to have completed fewer years of schooling in this country than had White individuals. Further, many adults of Asian/Pacific Islander and Hispanic origin were born in other countries and were likely to have learned English as a second language.

o Of all the racial/ethnic groups, Hispanic adults reported the fewest years of schooling in this country (just over 10 years, on average). The average years of schooling attained by Black adults and American Indian/Alaskan Native adults were similar, at 11.6 and 11.7 years, respectively. These groups had completed more years of schooling than Hispanic adults had, on average, but more than a year less than either White adults or those of Asian/Pacific Islander origin.

o With one exception, for each racial or ethnic group, individuals born in the United States outperformed those born abroad. The exception occurs among Black adults, where there was essentially no difference (only 3 to 7 points). Among White and Asian/Pacific Islander adults, the average differences between native-born and foreign-born individuals range from 26 to 41 points across the literacy scales. Among Hispanic adults, the differences range from 40 to 94 points in favor of the native born.

o Twelve percent of the respondents reported having a physical, mental, or other health condition that kept them from participating fully in work or other activities. These individuals were far more likely than adults in the population as a whole to demonstrate performance in the range for Levels 1 and 2. Among those who said they had vision problems, 54 percent were in Level 1 on the prose scale and another 26 percent were in Level 2.

o Men demonstrated the same average prose proficiencies as women, but their document and quantitative proficiencies were somewhat higher. Adults in the Midwest and West had higher average proficiencies than those residing in either the Northeast or South.

o Adults in prison were far more likely than those in the population as a whole to perform in the lowest two literacy levels. These incarcerated adults tended to be younger, less well educated, and to be from minority backgrounds.

LITERACY AND SOCIAL AND ECONOMIC CHARACTERISTICS

o Individuals demonstrating higher levels of literacy were more likely to be employed, work more weeks in a year, and earn higher wages than individuals demonstrating lower proficiencies. For example, while adults in Level 1 on each scale reported working an average of only 18 to 19 weeks in the year prior to the survey, those in the three highest levels reported working about twice as many weeks--between 34 and 44. Moreover, across

the scales, individuals in the lowest level reported median weekly earnings of about \$230 to \$245, compared with about \$350 for individuals performing in Level 3 and \$620 to \$680 for those in Level 5.

o Adults in the lowest level on each of the literacy scales (17 to 19 percent) were far more likely than those in the two highest levels (4 percent) to report receiving food stamps. In contrast, only 23 to 27 percent of the respondents who performed in Level 1 said they received interest from a savings or bank account, compared with 70 to 85 percent in Levels 4 or 5.

o Nearly half (41 to 44 percent) of all adults in the lowest level on each literacy scale were living in poverty, compared with only 4 to 8 percent of those in the two highest proficiency levels.

o On all three literacy scales, adults in the higher levels were more likely than those in the lower levels to report voting in a recent state or national election. Slightly more than half (55 to 58 percent) of the adults in Level 1 who were eligible to vote said they voted in the past five years, compared with about 80 percent of those who performed in Level 4 and nearly 90 percent of those in Level 5.

REFLECTIONS ON THE RESULTS

In reflecting on the results of the National Adult Literacy Survey, many readers will undoubtedly seek an answer to a fundamental question: Are the literacy skills of America's adults adequate? That is, are the distributions of prose, document, and quantitative proficiency observed in this survey adequate to ensure individual opportunities for all adults, to increase worker productivity, or to strengthen America's competitiveness around the world?

Because it is impossible to say precisely what literacy skills are essential for individuals to succeed in this or any other society, the results of the National Adult Literacy Survey provide no firm answers to such questions. As the authors examined the survey data and deliberated on the results with members of the advisory committees, however, several observations and concerns emerged.

Perhaps the most salient finding of this survey is that such large percentages of adults performed in the lowest levels (Levels 1 and 2) of prose, document, and quantitative literacy. In and of itself, this may not indicate a serious problem. After all, the majority of adults who demonstrated limited skills described themselves as reading or writing English well, and relatively few said they get a lot of assistance from others in performing everyday literacy tasks. Perhaps these individuals are able to meet most of the literacy demands they encounter currently at work, at home, and in their communities.

Yet, some argue that lower literacy skills mean a lower quality of life and more limited employment opportunities. As noted in a recent report from the American Society for Training and Development, "The association between skills and opportunity for individual Americans is powerful and growing.... Individuals with poor skills do not have much to bargain with; they are condemned to low earnings and limited choices."

The data from this survey appear to support such views. On each of the literacy scales, adults whose proficiencies were within the two lowest levels were far less likely than their more literate peers to be employed full-time, to earn high wages, and to vote. Moreover, they were far more likely to receive food stamps, to be in poverty, and to rely on nonprint sources (such as radio and television) for information about current events, public affairs, and government.

Literacy is not the only factor that contributes to how we live our lives, however. Some adults who displayed limited skills reported working in professional or managerial jobs, earning high wages, and participating in various aspects of our society, for example, while others who demonstrated high levels of proficiency reported being unemployed or out of the labor force. Thus, having advanced literacy skills does not necessarily guarantee individual opportunities.

Still, literacy can be thought of as a currency in this society. Just as adults with little money have difficulty meeting their basic needs, those with limited literacy skills are likely to find it more challenging to pursue their goals--whether these involve job advancement, consumer decision making, citizenship, or other aspects of their lives. Even if adults who performed in the lowest literacy levels are not experiencing difficulties at present, they may be at risk as the nation's economy and social fabric continue to change.

Beyond these personal consequences, what implications are there for society when so many individuals display limited skills? The answer to this question is elusive. Still, it seems apparent that a nation in which large numbers of citizens display limited literacy skills has fewer resources with which to meet its goals and objectives, whether these are social, political, civic, or economic.

If large percentages of adults had to do little more than be able to sign their name on a form or locate a single fact in a newspaper or table, then the levels of literacy seen in this survey might not warrant concern. We live in a nation, however, where both the volume and variety of written information are growing and where increasing numbers of citizens are expected to be able to read, understand, and use these materials.

Historians remind us that during the last 200 hundred years, our nation's literacy skills have increased dramatically in response to new requirements and expanded opportunities for social and economic growth. Today we are a better educated and more literate society than at any time in our history. Yet, there have also been periods of imbalance--times when demands seemed to surpass levels of attainment.

In recent years, our society has grown more technologically advanced and the roles of formal institutions have expanded. As this has occurred, many have argued that there is a greater need for all individuals to become more literate and for a larger proportion to develop advanced skills. Growing numbers of individuals are expected to be able to attend to multiple features of information in lengthy and sometimes complex displays, to compare and contrast information, to integrate information from various parts of a text or document, to generate ideas and information based on what they read, and to apply arithmetic operations sequentially to solve a problem.

The results from this and other surveys, however, indicate that many adults do not demonstrate these levels of proficiency. Further, the continuing process of demographic, social, and economic change within this country could lead to a more divided society along both racial and socioeconomic lines.

Already there is evidence of a widening division. According to the report **AMERICA'S CHOICE: HIGH SKILLS OR LOW WAGES!**, over the past 15 years the gap in earnings between professionals and clerical workers has grown from 47 to 86 percent while the gap between white collar workers and skilled tradespeople has risen from 2 to 37 percent. At the same time, earnings for college educated males 24 to 34 years of age have increased by 10 percent while earnings for those with high school diplomas have declined by 9 percent. Moreover, the poverty rate for Black families is nearly three times that for White families. One child in five is born into poverty, and for minority populations, this rate approaches one in two.

In 1990, then-President Bush and the nation's governors, including then-Governor Clinton, adopted the goal that ALL of America's adults be literate by the year 2000. The responsibility for meeting this objective must, in the end, be shared among individuals, groups, and organizations throughout our society. Programs that serve adult learners cannot be expected to solve the literacy problem alone, and neither can the schools. Other institutions--ranging from the largest and most complex government agency, to large and small businesses, to the family--all have a role to play in ensuring that adults who need or wish to improve their literacy skills have the opportunity to do so. It is also important that individuals themselves come to realize the value of literacy in their lives and to recognize the benefits associated with having better skills. Only then will more adults in this nation develop the literacy resources they need to function in society, to achieve their goals, and to develop their knowledge and potential.

FOOTNOTES

1/ A.J. Carnevale and L.J. Gainer. (1989). THE LEARNING ENTERPRISE. Washington, DC: U.S. Department of Labor, Employment and Training Administration.

2/ L.C. Stedman and C.F. Kaestle. (1991). "Literacy and Reading Performance in the United States from 1880 to the Present," in C.F. Kaestle et al., LITERACY IN THE UNITED STATES: READERS AND READING SINCE 1880. New Haven, CT: Yale University Press. T. Snyder (ed.). (1993). 120 YEARS OF AMERICAN EDUCATION: A STATISTICAL PORTRAIT. Washington, DC: National Center for Education Statistics.

3/ U.S. Department of Labor. (1992, April). LEARNING A LIVING: A BLUEPRINT FOR HIGH PERFORMANCE. Washington, DC: The Secretary's Commission on Achieving Necessary Skills (SCANS). R.L. Venezky, C.F. Kaestle, and A. Sum. (1987, January). THE SUBTLE DANGER: REFLECTIONS ON THE LITERACY ABILITIES OF AMERICA'S YOUNG ADULTS. Princeton, NJ: Educational Testing Service.

4/ National Center on Education and the Economy. (1990, June). AMERICA'S CHOICE: HIGH SKILLS OR LOW WAGES! THE REPORT OF THE COMMISSION ON THE SKILLS OF THE AMERICAN WORKFORCE. p. 20.

The full report, including all the tables, is available from the Government Printing Office. Please use the order form provided below.

For more information about the survey content or upcoming reports, call Andrew Kolstad at (202) 219-1773 or via Internet-- Andrew_Kolstad@DOED.GOV on Internet.

OFFICE OF EDUCATIONAL RESEARCH AND IMPROVEMENT
ELECTRONIC BULLETIN BOARD/INet
GPO PUBLICATION ORDER FORM

TO FAX YOUR ORDERS (202) 512-2250

Title: NALS Raises Vital Equity Issues

Author: Stephen Reder

Form of material : Panel presentation

Publication information: summary (1994) of presentation at the Congressional Black Caucus Foundation's Twenty-third Annual Legislative Weekend, chaired by the Hon. Donald M. Payne of New Jersey, September 16, 1993 in Washington, DC.

Source: TV Ontario via Internet

This article is a summary of Stephen Reder's panel presentation at the Congressional Black Caucus Foundation's Twenty-third Annual Legislative Weekend. The panel, chaired by the Hon. Donald M. Payne of New Jersey, was convened on September 16, 1993 in Washington, DC.

The recently released National Adult Literacy Survey (NALS), reporting data collected in 1992 by the National Center for Education Statistics, represents the most comprehensive assessment in decades of adults' literacy capabilities and needs. The survey involved a random sample of about 26,000 of the nation's adult population (age 16 and over).

The NALS survey, conducted in homes, included an interview to obtain information about individuals' social, economic, and educational histories and status as well as their literacy activities. It also included an assessment of their functional literacy capabilities. The assessment consisted of simulated functional or real-world tasks, like filling in a form, extracting information from a chart, and looking through a newspaper article for needed information. These items, which ranged in format, complexity, and difficulty, were designed to assess individuals' abilities to process information in prose, document, and quantitative tasks. Numerical proficiency scores were estimated for each individual's prose, document, and quantitative literacy abilities based on the tasks that they were able to perform correctly. These scores range from 0-500 on each scale and were categorized at one of five general levels of proficiency. According to the NALS report, individuals at the two lowest proficiency levels are able to perform a limited range of relatively simple tasks; but individuals functioning at these levels have substantial difficulties performing more challenging literacy tasks, particularly those requiring higher level reading and problem-solving skills.

RESULTS OF THE NALS

The results of the NALS are striking. Nearly half of the nation's adults, 16 years and older, perform at the two lowest levels of proficiency. The NALS report demonstrates that the literacy proficiencies measured by this assessment are closely related to indicators of the social and economic well-being of individuals and families, such as labor force participation, income level, poverty status, involvement with the criminal justice system, and voting activity.

As important as these findings are regarding the nation as a whole, the data regarding Blacks need to be highlighted. The NALS reports that 75-80% of Black adults in the United States are functioning at the two lowest proficiency levels, compared to 38-43% of White adults. Correspondingly higher concentrations of non-employment, low income, poverty, welfare utilization, and incarceration are found among Black adults in these data as well.

EDUCATION AND LITERACY

Education has long been the primary means by which literacy skills have been taught and learned in our society. Analysis of the NALS data indicates that educational attainment is the strongest determinant of proficiency, for both Whites and Blacks. The more schooling individuals have, the higher their performance on these assessments. But there is, nonetheless, a striking gap between Blacks' and Whites' functional literacy capabilities at each level of educational attainment, from less than high school up through postbaccalaureate

degrees. On all three literacy scales, for example, the average score for Blacks who have completed a four-year college degree is about the same as that for Whites who have completed only a high school degree.

EDUCATION, LITERACY, AND ECONOMIC OUTCOMES

Being fully cognizant of the many important issues and questions involved in interpreting such performance differences on standardized tests like this one, there are, nevertheless, important reasons not to dismiss these data. When we look at economic outcomes, such as wages, earnings, and poverty status, we find strong positive correlations between educational attainment and economic outcomes. But even after we take educational attainment into account, there are major gaps between the earnings of Blacks and Whites. At constant levels of education, Whites earn significantly more than Blacks. These relationships are well-established in a variety of studies and data sources.

But our analysis of statewide adult literacy surveys in Oregon and Mississippi and a national survey of clients in U.S. Department of Labor programs (which used instrumentation very similar to NALS) adds a vital piece of information: Wages and earnings are positively related to functional literacy (as measured by these instruments) even when educational attainment is held constant. The labor market is rewarding the skills and knowledge tapped by the NALS test, even after educational attainment (and other background variables) are taken into account. Indeed, the wage gap between Blacks and Whites disappears when the effects of both education and literacy are held constant.

It is important that this point be made clear. When predicting average wage or personal income with multiple regression techniques, there is no difference between Blacks and Whites when both education and literacy are equated. Therein lies both the good and bad news. The good news is that, possibly, if the gap were closed between Blacks' and Whites' functional literacy capabilities (as measured by this test), economic gaps might close as well. The bad news, of course, is that there are major literacy differences between Blacks and Whites at each level of educational attainment. Furthermore, there is little indication in these data that the disparity between Blacks' and Whites' literacy skills at given levels of education is diminishing over time, even as the gaps in educational attainment are closing between Whites and Blacks.

A NEW STRATEGY FOR EQUITY

These results suggest that we may need to rethink and broaden our approach to educational equity. In recent decades, the equity emphasis has been on expanding and equalizing access to education. We have worked hard at increasing access to schooling. This valiant effort has paid off well for many children. Gaps in educational attainment have significantly narrowed. The assumption behind this work has been that educational attainment leads to functional competence which in turn leads to economic and social rewards. But our analysis of the NALS data indicates that this equity of access to schooling, although clearly necessary, may not be sufficient. We must attend to equity in the outcomes of schooling, especially functional literacy with its attendant social and economic byproducts. An expanded and equitable access to literacy learning is required.

WHAT TO DO

How can we promote equity of access to literacy learning in order to ensure that our children not only attain the schooling and degrees they desire, but also the functional literacy capabilities valued in society's labor market and essential for our collective social and economic well-being? Three general directions are suggested for policy and program development. All may require new ways of doing business in schools.

First, we must support equity in functional literacy outcomes--not just equity in the amount of seat-time or degrees obtained. Equity of literacy outcomes must become a policy and programmatic goal in itself, and a criterion for excellence in education.

Second, we must promote access to literacy learning in all of its contexts, including but not limited to schools. There is growing evidence that literacy is learned in both schools and many nonschool settings, including the home, the community, and the workplace. Opportunities for learning must be accessible and rewarding across the lifespan. Programmatic efforts must engage and serve not only schoolchildren but also the many millions of adults needing better functional capabilities.

Third, we must assure that the new standards movement incorporates the above concerns. The issue here is not so much whether there should be reform and new standards, but making sure that such sweeping changes are designed to promote equity in access to learning and in outcomes. Our analyses suggest that minority children and families may face new inequities if traditional educational standards such as a high school diploma are replaced by performance thresholds on functional literacy tests like the NALS.

These are three directions in which policy and programs should evolve as we reform our schools and restructure opportunities for literacy learning that lead to equitable social and economic rewards. Filling in the many necessary details of design and implementation will take years of hard work. But such reform is possible if we proceed from a clear vision of not only what we want our children to know, but also of what kind of world we want them to live in. Excellence and equity in adult literacy must grow hand in hand.

STEPHEN REDER is the director of the Literacy, Language, and Communication Program at the Northwest Regional Educational Laboratory and is director of NCAL's research project on Interpretations and Secondary Analyses of the National Adult Literacy Surveys.

Title: Basic Skills in the Total Quality Workplace (An organizational focus)

Author: Glenda Lewe

Complete text:

Adult educators are facing many new challenges in the design and delivery of workplace education programs. Companies, anxious to obtain a competitive edge, have moved from introspection to action. Not only has machinery and technology changes, so has the way in which companies are organized, positions staffed and workers evaluated. Upgrading in the workplace, whether in trade and technical competencies, or in basic skills such as literacy and numeracy, can no longer be viewed from an education perspective alone. An organizational focus on education and training has become an imperative.

Obtaining a detailed understanding of the new management and organizational philosophies recently introduced into North American workplaces is no simple task, either for trainers housed within corporations or those invited in from the outside, such as adult educators. Yet such understanding is required to propel training design and curriculum development into the 21 century. How will the changing world of business administration and organization affect education service providers in their outreach to workers?

The Total Quality Context

Total Quality Management is transforming many North American workplaces. The worlds of business and labour are abuzz with new ideas, ranging from use of statistical tools to team building to a focus on the needs of the customer. Many companies have established in-depth training in the area of Total Quality, either hiring consultants or developing an in-house expertise. This training tends to emphasize three major areas:

1. Understanding TQM as a philosophy;
2. Building teamwork skills on lateral rather than a hierarchal basis;
3. Explanation and use of the Process Improvement tools of TQM, sometimes referred to as "The Seven Statistical Tools" and the "New Seven".

What sometimes gets lost in the shuffle in basic skills training, the necessary precursor of the more in-depth training done in the area of TQM. More often than not, the trainers who join corporations to provide TQM training are experts either in the area of management, communications, or statistics. These trainers have also usually had little exposure to the world of basic skills. The provision of literacy and numeracy training in the workplace continues to be handled for the most part by adult education professionals from community colleges, secondary schools or social service organizations. Adult educators have developed a wide range of techniques and approaches to literacy instruction in the workplace. Many adult educators, however, have now reached a crossroads. They are now hearing about Total Quality in the workplace but often they do not have enough knowledge about it to ensure that their own programs are consistent with the Total Quality dynamic.

Even if many adult educators are already delivering basic skills programs in Statistical Process Control or Team Building, they may fall into any number of traps if they are doing so without first understanding the dynamics of the Total Quality philosophy. If corporate leadership senses that adult educators operate in a TQ vacuum, they may think twice about inviting them in to provide basic skills training. If needed trainers are invited in less frequently, they may not even understand that the reason lies with their own lack of understanding of what is needed for "transformation" in the workplace.

A good place to start in understanding the TQ philosophy is with Dr. W. Edwards Deming, the American statistician widely credited with transforming Japan from a manufacturer of cheap toys to a world class giant best known for manufacturing high class goods and satisfying customers. Along with another American colleague, Dr. Joseph Juran, Dr. Deming introduced into post-war Japan and later into North America, the concept of "continuous improvement" of processes and services. Based on a combination of statistics and psychology, and a "systems" approach to management and production, the concept of "continuous improvement" became the backbone of what was later referred to as the Total Quality philosophy.

Dr. Deming's philosophy is summed up in his 14 Points and 7 Deadly Diseases (Deming, 1982). While different experts may disagree as to which of the 14 points are paramount and which of the 7 Deadly Diseases are most pernicious, it is probably accurate to describe the Deming view by 11 characteristics:

1. Focus on the customer;
2. A "systems" approach;
3. A long-term relationship with suppliers;
4. Enlarged communication and dialogue between workers in different divisions and levels. Employee involvement in continuous problem solving and decision making;
5. Understanding of variation, with processes in "statistical control";
6. Replacement of numerical goals by methods to improve the process;
7. Abolition of merit pay and performance evaluation;
8. Adoption of a Learning Cycle known as PDSA (Plan, Do, Study, Act);
9. Elimination of "non-value-added" parts of processes;
10. Emphasis on training and education;
11. Replacement of competition by cooperation.

Each of these characteristics has implications for basic skills trainers in a high performance workplace.

At this point, a word of warning is warranted. Total Quality Management is intended to be a total package rather than a pick and choose exercise. Together, the elements add up to what has been called the three "Cs" -- Customer, Counting, Culture (Sashkin, Kiser, 1993). There is, however, a great deal of diversity in HOW the philosophy has been implemented in various workplaces. Some companies have embraced certain aspects enthusiastically, while leaving others untouched. Others have made every effort to have a full-scale

implementation, with differing degrees of success, depending on the level of commitment and the care taken in implementation. This may cause confusion for an adult educator gaining access to a company for the first time. It will be helpful to remember that TQM, as any emerging management philosophy, will need time to develop. You may detect, therefore, chinks in the armour-and perhaps even the mixing of diametrically opposed philosophies within a single workplace. Knowing the core of the philosophy, however, will assist you to sort out anomalies, and thus deal more effectively with the workplace realities which you meet.

Implications

Basic Skills service providers have always prided themselves on their knowledge of adult learning needs and teaching methodologies, and rightly so. Knowledge of the new management theories and their application is, however, equally important if training is to be relevant for the evolving workplace reality. Many adult educators are beginning to realize that management styles are just as important as learning styles, and that the TQ environment will shape all training activity in ways previously not considered.

Here is some advice to guide basic skills trainers in a TQ environment:

1. Take a "systems" approach to the basic skills need assessment. This should fully take into account the total system, from supplier to customer, and recognize the lateral rather than hierarchical nature of working relationships.
2. Learn the ABCs of Total Quality. Then realize that there is much adversity in implementation. Talk to managers, labour representatives, and workers to find out which elements of TQM are scrupulously observed and which are only partially implemented.
3. Keep in mind that statistical concepts are an important aspect of TQM. Some workers may need help in understanding the basics of statistical thinking before they can appreciate the diversity of statistical tools and their uses. You can help by building this knowledge base, using their own experiences. Then investigate how the various statistical tools will lead to continuous improvement.
4. Be aware of the ways in which "language based knowledge" and "numbers based knowledge" intertwine in the use of statistical tools. It may help if trainees are encouraged to interpret control charts and their implications in words (spoken and written) to facilitate analytical thinking of how statistical information can be used (just drawing up the charts correctly is not enough). Use the completed charts as a basis for dialogue.
5. Illustrate how various tools can be applied to measurement of production or administrative processes. Assist trainees to determine which tools are clearer in identifying trends, in establishing process capability, in distinguishing between natural and unnatural variation. Then move from the classroom to the shop floor so that real life scenarios can be added to simulations done in the classroom.
6. Remember that the psychological (affective) aspects of Total Quality are just as important as the statistical tools. In planning course content and approaches, give consideration to how to encourage employee empowerment and decision making. This will mean helping trainees identify areas in which they would like to improve their skills so that they can act more autonomously. Mould your role to facilitator rather than instructor. And, since education is just as important as training in a TQ environment, you will be able to focus content on learning goals which go beyond immediate workplace concerns. This will be important to educators who favour a holistic approach to learning.
7. Examine the degree of commitment to TQM in the workplaces in which you are provided training. Some companies are paying lip service only to TQM. Others are facing considerable labour resistance. Such factors will affect the organizational culture in major ways, not the least of which is the extent to which workers will be empowered to take autonomous actions.

8. Remember that TQM is intended to be a total package rather than a "mix and match" choice. "Doing SPC," for instance, without placing it squarely within the parameters of continuous improvement misses the point. The implications for training are obvious. Training in SPC goes beyond the statistical content and goes to the underlying uses relating to process modification. What is the use of learning to apply the tools if no change occurs as a result?

Some adult educator may view this advice with bemusement. After all, a great deal of training is presently taking place that does not take into account these precepts, yet are affording satisfaction to both trainers and trainees. Clearly, one should not throw the baby out with the bath water. It is not so much that present training practices should be ended but rather that they should evolve in ways which reflect the Continuous Improvement paradigm. If, for instance, workers attain only technical statistical skills without the required communicative and problem solving skills, Continuous Improvement will not happen.

However, just as one begins to feel comfortable with the world of Total Quality, related movements appear on the horizon. They are realities, not mirages. Expect to move from Total Quality to the related world of ISO 9000. "ISO" is the International Standards Organizations and ISO 9000 refers to quality standards, originally developed in Europe for the European Economic Community, but is now appearing in a workplace near you! Many companies which have already introduced TQ are securing their competitive advantage through registering their quality performance with an ISO certifying body. While ISO 9000 is not a part of the TQ movement as such, there is a link. Companies which have proceeded a good distance along the road of Continuous Improvement should find that they have little difficulty in meeting ISO's requirement.

Whatever model is used to describe the approach to quality improvement, whether it is TQM, ISO 9000 or some other terms such as Bench-marking or Process Re-engineering, it is important to keep in mind that all these approaches are aiming for the same goal - continuously improved quality in products and service. The development of numeracy skills will be an essential aspect in securing this improvement. As a matter of fact, some employees who have dealt with numeracy very little in their worklife, will now be exposed to a variety of statistical concepts and problems. They will require assistance in making sense of these new dimensions of their jobs. Numeracy is only one aspect of the broader network of skills which also includes literacy, creative thinking and problem solving. None of these skills exists in a vacuum removed from the others. Therefore, language based and numbers based skills deserve to be integrated throughout the learning process, rather than separated into distinct phases as has often occurred in the past.

There is bound to be a certain degree of discomfort as educators previously unexposed to "transformation" management theories discover the multi-faceted nature of the Total Quality philosophy and the extent of its reach. It may be a Leviathan, but it is a Leviathan with energy. Educators who take on the giant may find the struggle worth the battle.

Title: Distinct Needs of Rural Literacy Programs
Organization: Ontario Rural Literacy Special Interest Group
Publication information: March 1994
Complete text:

Rural literacy programs are different from their urban counterparts. Rural communities and rural literacy programs have distinct geographic, economic, social, and employment characteristics which create barriers to teaching, learning, and program and community development.

These barriers include isolation; increased expenses due to travel, long distance, and reduced numbers; limited supporting services; negative connotation of 'literacy'; limited relevant materials; and minimal research into the problems and literacy programs of rural Ontario.

These barriers need to be addressed through distinct policies and funding mechanisms for rural programs.

Summary of Recommendations

1. Rural representation is critical on government policy-making committees.
2. A distinct costing mechanism is essential for rural literacy programs.
3. Funds and equipment must be available for effective networking.
4. Rural literacy programs need support to offer a wide spectrum of services.
5. There needs to be support for the development of relevant materials for rural adult learners.
6. Research must be carried out on the needs of adult learners and barriers to participation in rural Ontario.

INTRODUCTION

Ontario Rural Literacy is a special interest group of adult educators concerned with the particular needs of literacy program deliverers and learners in the rural areas of Ontario. We are interested in promoting awareness of literacy issues among the general public as well as providing support to our member programs. There are 12 members of the provincial steering committee representing all regions of Ontario and various sectors providing literacy programming (community-based, college, and school board).

Seventy-four programs are contacted for input on our yearly grant proposal, given information about conferences and workshops, and provided with display and promotional materials.

We have become increasingly aware of the distinct nature and special needs of rural literacy programs as we share information at our meetings and conferences. The Rural Special Projects which were funded by the Literacy Branch in 1993-94 further highlighted the distinctness of rural programs and the importance of making our needs and recommendations known.

THE PROBLEM

Rural literacy providers and learners have needs which are distinct from those of their urban counterparts. They require distinct approaches, funding mechanisms, and policies to help overcome the barriers to meeting these needs.

We are very concerned that the currently proposed education and training plan will not meet the needs of rural learners and communities.

The establishment of Local Training and Adjustment Boards (LTABs) concerns many literacy providers. Who will sit on the boards? Will they be knowledgeable and sensitive to the needs of rural literacy program providers and learners? Small-town politics, where a few individuals often play multiple roles, can skew representation. If labour, by definition a non-rural sector, is to have eight out of 20 seats, who will represent the rural voice? Business is also concentrated in urban areas.

In local board areas where there are one or two urban areas, there is a real danger that the urban areas will have the preponderance of seats and rural concerns will not be represented. The potential is for LTABs to become very urbanized.

Rural voices are already under represented in provincial decision-making meetings. Rural representation must be proportional to the rural population in any given local board.

This report draws on examples from the Rural Special Projects which were funded in 1993-94 by the Literacy Branch of the Ministry of Education and Training to support this thesis. Experiences of other rural literacy programs are also cited.

THE SITUATION

A report entitled "Rural Literacy in Ontario," compiled in 1989 by Sandra da Costa, described the work of rural literacy providers who met through the Ontario Literacy Coalition beginning in 1987. This ad hoc committee recognized the need for a well-organized rural literacy network to advocate on behalf of rural literacy programs' special needs. The problems identified were:

- * isolation
- * lack of access to resources
- * limited or no public transportation
- * time needed to cover large distances
- * cost of long distance calls
- * adequate facilities
- * outreach
- * seasonal work
- * lack of day care
- * confidentiality.

The successor to this committee, the Ontario Rural Literacy Special Interest Group, fully agrees with this list of problems. This report categorizes the problems under the headings of distance, isolation, employment, and social character, and makes recommendations for policy development and funding mechanisms.

Distance

Geographic barriers are created by significant distances and the lack of public transportation. They result in higher operating costs and the potential isolation of learners and practitioners.

People looking at literacy from an urban perspective can find it difficult to comprehend the distances that some rural programs cover. Rural programs must do outreach and direct service at the same time; outreach can mean having to travel hundreds of kilometres to make people in several communities aware that you can provide direct service to them. For a learner without a car, it may mean no service. The Lambton Learning Lab has shown that a mobile bus is very helpful to people in rural areas.

The cost of distance accumulates in a range of forms, from long-distance phone charges and gas to significant travel time and logistical problems in linking tutors and learners.

A tutor from the North Channel Literacy Council who lives and works on Manitoulin Island tells about three learners in the Mindemoya area, clients of the Association for Community Living (ACL), who were being transported to Gore Bay for tutorials by ACL staff. ACL had been bearing the cost of a staff person's time and travel (about an hour and a half driving on rural roads per week).

When ACL suggested that they would not be able to provide transportation any longer, an alternative arrangement of setting up a small group for the learners in the Mindemoya area was made even though the

tutor didn't think the group would be as effective as the previous arrangement. In the end, ACL has continued providing transportation to individual tutors' homes, but the possibility of this service ending and a compromise arrangement being established is very real.

Isolation

Isolation affects both practitioners and learners. Networking for professional or personal development is more difficult in rural areas. Sharing resources, not to mention ideas and concerns, is also more cumbersome and costly to orchestrate. Group meetings for learners are difficult to organize.

Ann Slater of the Adult Literacy Program in St. Marys writes about the difficulty of organizing small groups: "I think small groups in rural areas do end up being whoever you can get. I find it is difficult to even find 3 or 4 people who are available at the same time and are interested in being in a small group. Being available at the same time also involves being able to get to a central location at the same time because there is no public transportation. People often have to schedule their learning time around when the family car is available."

Further to the problem of working in small groups, she adds, "I think it is often easier to work in small groups when there is some common interest or similar levels. This isn't possible in rural areas usually -- to have a small group we have to be prepared for diversity in interest, in levels, etc. I think we also have to be prepared for small groups to be very small -- 2, 3, or 4 people."

In her 1989 report, Sandra da Costa noted other consequences of isolation which affect learners. Isolation, she wrote, "can keep illiteracy a private, shameful thing," and "learners may not have experienced much social interaction and may feel intimidated by tutors coming into their homes."

Isolation also discourages the exchange of resources and weakens attempts to learn about and evaluate programs. The Huron Literacy Project of Centralia College closed down last year when funding for this program was cut off. Thirty trained volunteer tutors now are working without a resource base and there is no one keeping track of their work.

Employment

The workplace in rural areas often consists of one or a small number of employees. For this reason, unemployment can be hidden as there are no massive shutdowns to make the news. And, in an individually run business, one person must have many skills.

Rural along with urban employment has been requiring higher literacy levels. The 1993 law requiring farmers to pass an exam before being able to transport or use pesticides is a case in point.

Employment in rural areas is typically seasonal, whether the local economy is based on tourism, agriculture, or resource industries. Seasonal employment affects the availability and energy level of learners. It is difficult to find time for class hours during haying season or have regular classes when an adult has already put in a long day at a physically demanding job. Some learners are only able to attend literacy classes while unemployed.

Social character

Rural and small communities have a distinct character. First of all, by definition, they are small in terms of population. People tend to know one another and recognize newcomers as outsiders. It takes time to build trust and start programs. In a rural setting it usually takes three to five years to become known in the community.

The manager of North Frontenac Literacy Program developed a project called TREET (Towards Rural Education and Employment Training). They spent the first year establishing structures and links in the community to get local stakeholders involved.

Social characteristics of rural areas can be supports as well as barriers. Developing trust and establishing networks can take longer but also be longer-lasting. Personal contact lines may cross more often, creating a stronger network or, on the other hand, more competition. One-year pilot projects that raise the community's expectations can be disastrous when you face the same people again and again after the project ends. In fact, the very concept of a pilot project may be counter to the needs of rural residents. In urban and rural communities, a continuum of services is always the goal; however, in rural areas there are fewer programs to offer that continuum. If one literacy program, by default, provides a whole range of services, think of the consequences when all or part of that program is not funded again.

Another social barrier is the fear of losing one's anonymity. In some communities, there may be a stigma associated with the term "literacy," and even "upgrading" is not always viewed positively. "Coming out" to a literacy program in a small town is a risk. As long as there is such a stigma, there will be adults who will not want to be associated with a literacy program.

Literacy classes may be worked in with computer training, food and nutrition classes, pesticide training, or Workplace Hazardous Materials Information System (WHMIS) training. This takes extra time and money.

The manager of the Literacy Council of Lincoln focused more on employment services than literacy. In her area of the Niagara Peninsula, there is no public transportation and a 16 per cent unemployment rate. Since she felt that literacy would carry a negative connotation, they called what they were offering free one-on-one training rather than literacy.

The Lanark County Reading Network initially focused on developing health brochures and publications that were clearly written. The network also provided special interest workshops, realizing that lack of awareness of a program's existence was another barrier to success.

Community development in rural areas needs strong leadership. Literacy programs do not only prepare adults for the workforce. Literacy supports lifelong learning and personal and cultural development, which contribute to healthy individuals and strong communities.

THE BARRIERS

There are many barriers to rural literacy programs which can be identified from the preceding descriptions.

Limited services

Because there are limited social, educational, and employment services, literacy providers tend to become "front-line workers" who must respond to a wide variety of needs. Sometimes a rural program has one staff person who does everything from coordinating outreach programs and making speeches, to performing secretarial duties, tutor training and delivering and producing materials, to helping learners get in touch with social agencies for extra personal help.

Rural programs do not have the luxury of specialization because of the lack of services in rural regions. Without the range of services that are often available in urban areas, it is necessary to have a very broad definition of literacy and to meet the needs of learners on several levels. For instance, there may not be an English as a Second Language program to refer a learner to or an employment counsellor available on a regular basis, if at all, in a rural community.

Limited accessibility of day care in rural areas makes it difficult for parents to attend literacy classes. In an article in Rural Adult Education Forum, Kathy Neill Keenan and Elisse Zack recommend parents bring their children with them. Tutors can help learners go through a book with their children or another person may read to the children while the parent is tutored.

Regional offices tend to operate on a limited basis and may actually be inaccessible to a rural resident who doesn't own a car. Some rural people may be hesitant to go to urban areas.

Funding issues

Rural programs cost more. Along with the obvious additional expense of travel and long-distance calls, there are hidden expenses. Outreach and promotion in rural areas take many forms: speaking engagements, posters, contacting all the library branches, to name a few. More research needs to be done on whether costing procedures developed for urban programs are appropriate to rural needs.

Funding mechanisms are often not sensitive to rural needs. In a rural setting "turf" often becomes a concern, as there can be a number of agencies asking the same people and companies for support.

As noted earlier, another problem is the short-term pilot project.

There is a danger in introducing a pilot program that may raise expectations and not be able to continue. After winning the trust and confidence of a community, it can be hard to pull out and ever hope to start something again.

Materials

There is also a need for relevant educational materials for rural learners and providers. Reading about the problems of the urban poor or learning how to read a bus schedule are not relevant to rural residents. The coordinator of Small Group Literacy, Killaloe, set up two learning centres. The major difficulty she faced was the lack of suitable materials for rural adult learners. On the other hand, learning material specific to rural needs is in high demand, as evidenced by the popularity of the Pesticide Pre-Course funded by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Two hundred new workbooks are printed each week during the peak winter season at the Ridgeway OMAFRA office.

Political issues

The development of a new provincial education and training system is of great concern to rural literacy providers. To restate the problem identified earlier, it is critically important that the rural dimension be understood and addressed by government policy makers. Rural communities must not be overshadowed by urban centres in their local board areas.

Another political barrier shows up in the urban language of granting agencies. Applications for grants ask for numbers of students and time and money needed to establish and develop literacy programs without distinguishing between urban and rural programs. References to other area agencies providing literacy services also make an urban assumption that there are other literacy services in the area!

Research

A Report of the Northwest Action Agenda Project, "Barriers to Rural Adult Education," noted that "a lack of data on the needs of rural adults and barriers to their participation has limited program expansion." The same could be said for rural Ontario. Research conducted by the Northwest Action Agenda Project led to aggregate lists of barriers. Both learners and providers believed that "when compared with their urban counterparts, the rural adult does not have equal access to educational opportunities." It was concluded that further research was needed to identify successful programs and to extract key elements and test their feasibility financially and politically. Efforts to share this information and replicate programs were also needed.

Too often program successes in rural areas go without notice or documentation.

RECOMMENDATIONS

These recommendations follow from the identification of barriers to rural literacy programs:

1. Rural representation is critical on government policy making committees, including the Ontario Training and Adjustment Board (OTAB) and the Local Training and Adjustment Boards (LTABs) with significant rural areas.
2. A distinct costing mechanism is essential for rural literacy programs. This mechanism should take into account increased costs for phone, travel time and distance, reduced number of learners and additional time required to get programs running. One-year pilot projects are not sufficient in rural areas and projects should be funded for at least two years.
3. Funds and equipment must be available for effective networking. The Ontario Literacy Communications Network (CoSy), the federally and provincially funded computer telecommunication system for literacy workers in Ontario, has been invaluable; its continued use should be ensured through adequate funding of the system and access to computers.
4. Rural literacy programs need support to offer a wide spectrum of services. Literacy should not be too narrowly defined and funding should be able to go towards employment preparation and other services people require. Family literacy programs help reverse the cycle of intergenerational illiteracy while at the same time providing a partial solution to the need for childcare. Interministerial (including OTAB) coordination of efforts could help ensure that literacy program activities don't have to be restricted.
5. There needs to be support for the development of relevant materials for rural adult learners.
6. Research must be carried out on the needs of adult learners and barriers to participation in rural Ontario. Successful programs need to be documented and evaluated; key elements should be identified, applied to other rural programs, and then evaluated.

REFERENCES

- Da Costa, Sandra. "Rural Literacy in Ontario." Lindsay, Ont., 1989.
- McDaniel, Robert H., et al. "Barriers to Rural Adult Education." A Report of the Northwest Action Agenda Project. Pullman, WA: Washington State University, 1986
- Neill Keenan, Kathy, and Zack, Elisse. "Rural Literacy: Our Neighbors to the North." Rural Adult Education Forum, Vol. 1, No. 3 (February/March 1989).

STEERING COMMITTEE MEMBERS

Barbara Shipley, coordinator
Denfield

Leah Morris, chair
Haldimand/Norfolk Literacy Council
Hagersville

Lindsay Kennedy, vice-chair
Wellington County Literacy Council
Arthur

Claudia Brown
North Frontenac Literacy Program
Sharbot Lake

Patricia Gibbons
North Channel Literacy Council
Elliot Lake

Maria Makrakis
Carleton Roman Catholic Separate School Board
Nepean

Andrea Leis Conestoga
College Literacy Program
Stratford

Diane Linstead
Reading Rising Adult Learning Program
Schreiber

Cindy Davidson
Walkerton

Anne Toth
Organization for Literacy in Lambton
Sarnia

Barbara Nangle
Haliburton Literacy Centre
Haliburton

Melinda McCoy
CORE Literacy
Cambridge

Anne Stupavsky
Lovesick Lake Native Women's Learning Centre
Buckhorn

**Title: If You Can't See It, How Can You Read It? Good Vision and Literacy --
There's a Clear Connection**

Publication information: published by the Canadian Association of Optometrists:
Complete text:

Children will not learn to read if they cannot focus on the chalkboard or on the words in a book.

Canada is facing a staggering rate of illiteracy -- some statistics place it as high as 25%.

We all have a role to play in eliminating the problem.

- * It is estimated that one in six children has a visual performance problem. Not all such problems are easy to detect. Young children have no basis for comparison of what their vision should be, and will accept limited vision as normal until someone identifies the problem.
- * Most visual problems fall into two categories:
 - 1) the obvious ones, which can be detected by the standard eye chart test;
 - 2) the not-so-obvious ones, which deal with such things as eye coordination, perceptual, or near point focusing problems. These are the problems that often inhibit a person's ability to read and learn.

Good Vision and Literacy

The eyes normally work together as a team. Images seen from each eye are merged into a single image in the brain. If the eyes are not coordinated, an individual may have difficulty reading.

Some symptoms that may indicate a child has a vision problem:

- * loses place while reading
- * avoids close work
- * holds reading material closer than normal
- * tends to rub eyes
- * has headaches
- * turns or tilts head to use one eye only
- * makes reversals when reading or writing
- * uses finger to maintain place while reading
- * omits or confuses small words when reading

Some behavioral indications of possible vision difficulty:

- * short attention span for the child's age, or frequent daydreaming
- * difficulty remembering what has been read
- * difficulty with sequential concepts
- * displays evidence of developmental immaturity

There's A Clear Connection

Vision is a set of skills and abilities. 20/20 (6/6) eyesight is only one of these. A child may see the chalkboard clearly at 20 feet (6m), but may still have symptoms such as blurred vision, eyestrain, headaches or fatigue while reading, due to problems with eye coordination or focusing.

- * At least 80% of all learning is visual.
- * There is scientific evidence which suggests children who experience reading difficulties are more likely to have vision problems than children who are accomplished readers.
- * As many as 3/4 of adults with challenged literacy skills, when tested, fail at least one section of a visual screening examination.
- * Most visual problems can be successfully treated. Early detection and correction will improve a child's ability to learn and read.

FACTS: CHILDREN AND VISION

* It is estimated that at least one in six children has a visual performance problem. In fact, some studies show as many as four out of every ten children may have vision problems that impair their ability to learn. * Children with poor eye coordination may have problems reading for long periods. This can lead to frustration when the child cannot keep up with his or her peers in the classroom, and result in behaviour problems. * A child who has not developed clear vision by age six is not apt to do so in later life. Parents are advised that they should take children for complete vision examinations between one and three years of age. * Parents and children in low income families are 400 per cent more likely to experience vision problems, and often do not take advantage of accessible health services to address these problems. * Reading requires the integration of eight different vision skills: visual acuity; visual fixation; accommodation; binocular fusion; convergence; stereopsis; field of vision; and form perception. * Many parents rely on vision screening tests in schools to identify problems with their children's vision. However, these tests do not check for many vision problems. Even a child with 20/20 vision (visual acuity) may have other vision problems. * Children who are avid readers have a tendency to become short-sighted in later life. Parents should encourage their children who read frequently to take breaks and get involved in different activities. * Quite simply, children will not learn to read if they cannot focus on the chalkboard or on the words in a book. Early detection and correction of vision problems is a major element in helping children become achieving readers. * Not all children with vision problems will require glasses. Some problems such as poor ability to "track" words on a page, or adjust from reading up close (a book) to far away (a blackboard) can often be corrected with daily eye exercises that parents can do with their child at home. * The visual ability to read print is elementary compared with the visual demands of many new technologies. Children will require excellent visual skills to deal with these new technologies throughout their lives.

For further information please contact:

The Canadian Association of Optometrists
301-1785 Alta Vista Drive
Ottawa, ON K1G 3Y6

Tel: (613) 739-4412

Fax: (613) 738-7161

Should Reading-Disabled Adults Be Distinguished From Other Adults Seeking Literacy Instruction? A Review of Theory and Research

Author: Anne E. Fowler, Bryn Mawr College and Haskins Laboratories and Hollis S. Scarborough, Brooklyn College of the City University of New York

Publication information: National Center on Adult Literacy. Technical Report TR93-7, September 1993

Source: Copyright 1993 National Center on Adult Literacy

Complete text without original graphics:

This report has been converted from Microsoft Word 5.1 to plain text; all formats and graphics have been deleted. Versions formatted in Microsoft Word 5.1 for the Macintosh are available from NCAL's Gopher server; formatted versions include all charts and graphs. Hard copies are also available from the NCAL.

Feel free to copy and distribute. This paper may be quoted or abstracted with proper citation; material changes must be approved by the National Center on Adult Literacy and the author.

Copyright 1993 National Center on Adult Literacy

This work was supported by funding from the National Center on Adult Literacy at the University of Pennsylvania, which is part of the Education Research and Development Center Program (Grant No. R117Q0003) as administered by the Office of Educational Research and Improvement, U. S. Department of Education, in cooperation with the Departments of Labor and Health and Human Services. The findings and opinions expressed here do not necessarily reflect the position or policies of the National Center on Adult Literacy, the Office of Educational Research and Improvement, or the U. S. Department of Education.

Published September 1993 by
National Center on Adult Literacy
University of Pennsylvania
3910 Chestnut Street
Philadelphia, PA 19104-3111
Phone (215) 898-2100 FAX (215) 898-9804

The National Center on Adult Literacy (NCAL) was established in 1990 by the U.S. Department of Education, with co-funding from the Departments of Labor and Health and Human Services. The mission of NCAL addresses three primary challenges: (1) to enhance the knowledge base about adult literacy, (2) to improve the quality of research and development in the field and (3) to ensure a strong, two-way relationship between research and practice. Through applied research and development and dissemination of the results to researchers, policy makers and practitioners, NCAL seeks to improve the quality of adult literacy programs and services on a nationwide basis. NCAL serves as a major operating unit of the Literacy Research Center at the University of Pennsylvania.

NCAL publications to date include:

May 1992 Matching Literacy Testing With Social Policy: What are the Alternatives? Richard L. Venezky (PB92-1, 8 pages)

Oct 1992 Life-span and Life-space Literacy: Research and Policy in National and International Perspective Daniel A. Wagner (OP92-1, 24 pages)

Oct 1992 Expanding Theories of Adult Literacy Participation Karen Reed Wikelund, Stephen Reder, Sylvia Hart-Landsberg (TR92-1, 40 pages)

- Oct 1992 Invitations to Inquiry: Rethinking Staff Development in Adult Literacy Education Susan L. Lytle, Alisa Belzer, Rebecca Reumann (TR92-2, 44 pages)
- Dec 1992 Developing the Professional Workforce for Adult Literacy Education Susan L. Lytle, Alisa Belzer, Rebecca Reumann (PB92-2, 11 pages)
- Jan 1993 The Impact of BIB-Spiralling Induced Missing Data Patterns on Goodness-of-Fit Tests in Factor Analysis David Kaplan (OP93-1, 18 pages)
- Mar 1993 The Impact of Workplace Literacy Programs: A New Model for Evaluation of Workplace Literacy Programs Larry Mikulecky, Paul Lloyd (TR93-2, 180 pages)
- Mar 1993 Literacy and Machines: An Overview of the Use of Technology in Adult Literacy Programs Terilyn C. Turner (TR93-3, 86 pages)
- Jun 1993 Literacy and Development: Rationales, Assessment, and Innovation Daniel A. Wagner (IP93-1, 50 pages)
- Jun 1993 Myths and Misconceptions in Adult Literacy: A Research and Development Perspective Daniel A. Wagner (PB93-1, 10 pages)
- Jun 1993 Early Childhood, Family, and Health Issues in Literacy: International Perspectives Laurel D. Puchner (IP93-2, 45 pages)
- Sep 1993 Prison Literacy: Implications for Program and Assessment Policy Anabel Newman, Warren Lewis, Carolyn Beverstock (TR93-1, 219 pages)
- Sep 1993 Management Information Systems in Adult Education: Perspectives from the States and from Local Programs Mark A. Kutner, Lenore Webb, Rebecca Herman, Pelavin Associates, Inc. (TR93-4, 150 pages)
- Sep 1993 What Can Employers Assume about the Literacy Skills of GED Graduates? David Kaplan, Richard L. Venezky (TR93-5, 45 pages)
- Sep 1993 Teamwork and Literacy: Learning from a Skills- Poor Position Sylvia Hart-Landsberg, Steve Reder (TR93-6, 63 pages)
- Sep 1993 Should Reading-Disabled Adults Be Distinguished From Other Adults Seeking Literacy Instruction? A Review of Theory and Research Anne E. Fowler, Hollis S. Scarborough (TR93-7, 101 pages)
- Sep 1993 When Less Is More: A Comparative Analysis of Methods for Placing Students in Adult Literacy Classes Richard Venezky, Page S. Bristow, John Sabatini (TR93-8, 46 pages)
- Sep 1993 Metacognitive Aspects of Adult Literacy Scott G. Paris, Andrea Parecki (TR93-9, 44 pages)
- Sep 1993 What Makes Worker Learn? The Role of Incentives in Workplace Education and Training Donald Hirsch, Daniel A. Wagner, ed. (IP93-3, 243 pages)

Information on ordering of NCAL publications may be addressed to Dissemination at NCAL. September 10, 1993

Table of Contents

Abstract

Introduction

A. Adult Illiteracy Versus Reading Disability: Fundamental Assumptions

1. Traditional Assumptions Regarding Literacy
2. Traditional Assumptions Regarding Reading Disability

B. Recent Challenges to Traditional Assumptions

1. Changes Within the Adult Literacy Field: Diversity and Individual Differences
2. Changes Within the Reading Disabilities Field: Validity and Reliability of Diagnoses, Matthew Effects, and Long-term Persistence
3. Summary of Converging Trends

C. Reading Acquisition in Childhood

1. Processes Involved in Skilled Reading
2. Word Recognition and Listening Comprehension in Relation to Each Other and to Reading Comprehension
3. Phonological Analysis of Speech and Phonological Decoding of Print
4. The Sequence of Development

D. The Development of Specific Reading Disability and Other Reading Problems in Childhood

1. Characteristics Associated with Specific Reading Disability
2. Comparisons of Specific Reading Disability and Other Reading Problems: Characteristics and Responses to Treatment

E. Recent Advances in our Understanding of the Reading- Disabled Adult

1. Early Views of Reading Disability in Adulthood
2. Methodological Considerations
3. Academic Achievement Levels in Reading-Disabled Adults
4. The Cognitive Linguistic Profile of the Reading- Disabled Adult
5. Adaptive Functioning in Reading-Disabled Adults: A More Heterogeneous Profile

F. Policy Implications: Defining, Diagnosing, and Treating the Adult with Reading Difficulties

1. Should Reading-Disabled Adults Be Distinguished from Other Poor Readers?
2. Can Reading-Disabled Adults Be Distinguished from Other Adults Seeking Literacy Instruction?
3. Choice of Diagnostic Instruments
4. Instructional Methods

G. Summary and Conclusions

Endnotes

References

Should Reading-Disabled Adults be Distinguished from Other Adults Seeking Literacy Instruction? A Review of Theory and Research

Anne E. Fowler

Bryn Mawr College and Haskins Laboratories

Hollis S. Scarborough

Brooklyn College of the City University of New York

Abstract

Recent research on the nature and treatment of reading disabilities during childhood and adulthood is reviewed and examined in relation to the characteristics and needs of the changing population of adults who seek assistance in improving their literacy skills. This study suggests that, in practice, if not necessarily in theory, there are fewer differences than traditionally has been assumed between adults with reading disabilities and adults with reading problems that are thought to stem from a lack of educational opportunity or from a generally weak aptitude for learning. Consequently, the argument can be made that much of what has been learned from research on reading disabilities may be pertinent to the identification and the literacy development of adult learners generally. In particular, this paper emphasizes the need to focus on improving adults' persistent difficulties with low-level word recognition skills, in addition to assisting with other impediments to successful reading comprehension.

Introduction

Although both the adult learning disability community and adult literacy community deal with adults whose limited reading skills interfere with daily living, the pedagogical approaches of the two communities have differed markedly in terms of traditional assumptions, target population, and treatment. This study analyzes why the dichotomy between illiteracy and reading disability may not be as useful as it once was and considers what is to be gained (or risked) by understanding illiteracy from a reading disability[1] perspective. Specifically addressed is how recent research on the causes, diagnoses, and treatment of reading disability in both children and adults may be applicable to detecting and working with illiterate or low-literate adults who may or may not be reading disabled.

Many readers of this study will be more knowledgeable than the writers about historical and current issues in the adult literacy field but may not be as familiar with some developments in the reading disabilities field. In what follows, therefore, the primary focus is on recent research concerning disabled readers, with the greatest emphasis on findings most relevant to the questions posed above.

The preview given below outlines the contents of this study, since the paper is long and all sections will not be of equal interest to different readers. First, sections A and B detail the logic of the argument that the two independent fields have much to gain from each other. Second, a brief summary is given of the historical differences between how illiteracy and reading disability have been conceptualized, studied, and treated. Third, recent shifts are reconstructed to emphasize what has occurred within both fields to result in an increasing overlap in ideas and practical goals. Fourth, sections E and F outline contemporary views of reading acquisition and reading disability in childhood. The size and scope of these sections reflect the intense amount of activity in this area of research; the casual reader or one already well-versed in the literature on reading in children may wish to refer only to the summary statements. Fifth, a review of the research on reading disability in adulthood is given; this research is obviously most germane to the major question of this paper. Finally, the implications of reading disability findings for understanding and working with low-literate adults are discussed.

A. Adult Illiteracy Versus Reading Disability: Fundamental Assumptions

1. Traditional Assumptions Regarding Literacy

Historically, when families depended heavily on the contributions of labor and wages from children, there were many individuals who received little or no schooling and hence never learned to read or write skillfully. Accordingly, literacy was viewed as a direct outcome of educational and cultural opportunity. To be illiterate was virtually synonymous with being unschooled, and years of schooling was taken as a reliable index of reading level. Once laws were passed to outlaw child labor and to mandate universal schooling, corresponding decreases in illiteracy were seen, as expected (Miller, 1988; Stedman & Kaestle, 1987).

Although, at present, the vast majority of U.S. residents have received more than a few years of schooling, it is estimated that about 20% fail to reach a level of skill in reading and writing sufficient "to understand and use the printed material one normally encounters in work, leisure, and citizenship" (Stedman & Kaestle, 1987). To explain the persistence of such functional illiteracy, it is necessary to consider the quality and context of schooling experiences rather than their mere availability. Today's illiterate adults are likely to come from culturally and economically defined subgroups of the population in which the education that is provided, the resources allocated to it, and its perceived role/function/value in the community is different from those of mainstream society. When functional illiteracy rates are examined in different sociocultural segments of the population, large differences emerge. For instance, 42% of African-American inner city youth, compared with only 9% of Caucasian-American 17-year-olds, did not meet literacy criteria in one notable investigation of such differences (Mullins & Jenkins, 1990). Despite universal schooling, "literacy remains inextricably tied to the social structure [and] reflects chronic differences among groups as well as the distribution of power in our society" (Stedman & Kaestle, 1987).

Growing out of this tradition, adult literacy programs have aimed to serve non-mainstream communities with high rates of illiteracy. Services have focused largely on self-selected individuals who choose to attend programs offered in the community, at the workplace, or elsewhere. Regardless of their childhood educational histories, many of these adults are likely to be better motivated to learn than they were in childhood because they now perceive that job advancement or other personal goals can be achieved by improving their reading and writing skills.

The diagnostic goals are two-fold: to determine an individual's level of literacy skill and to identify his or her broader treatment needs. With regard to the first goal, recent measures have been developed to assess literacy levels on the basis of functional skills, such as reading a prescription, completing a job application, writing a business letter, or understanding a technical manual. Functional literacy tests, such as the Test of Adult Literacy Skills (TALS, 1990), are currently used in national surveys as well as in the military and in adult education settings. With regard to the second goal, while knowing the individual's current skill level may serve as a starting point for literacy training, it is also important to evaluate the client's need for training more broadly in order to address not just skills development, but also the effective deployment of those skills to achieve broader objectives. (Venezky, Bristow, & Sabatini, in press, provide a fuller discussion of adult literacy measures.)

Instruction has been carried out by community volunteers, often on a one-to-one basis. Given that clients' needs may encompass not just literacy training but also personal growth and vocational planning, the contributions of the volunteer often extend beyond the role of teacher to include that of counselor, advocate, and friend as well. The fundamental assumption--rarely made explicit--is that all people can learn to read well if motivational and cultural barriers are removed. According to this view, no special instructional techniques or curricula are as important as the personal support provided by a caring person with stronger literacy skills. Miller (1988) described illiteracy as "a form of ignorance, not stupidity. Anyone intelligent enough to master spoken language should be intelligent enough to master written language" (p. 1290). The possibility that individuals in such programs may suffer deficiencies internal to themselves is usually considered of lesser importance (Fingeret, 1984). According to Miller, the actual "fraction of people suffering from this neurological condition [of dyslexia] is extremely small" (Miller, 1988, p. 1296).

Although illiteracy is traditionally viewed as an adult problem, it is presumed that its roots are embedded in early childhood experiences. Studies show that the gap in literacy achievement between advantaged and disadvantaged groups becomes progressively wider over time, with relatively small differences at the outset of schooling gradually increasing to as much as a four-year difference in reading level (Mullins & Jenkins, 1990). While adult literacy programs aim to reduce illiteracy in the adult population, the prevention of widespread illiteracy in future generations has been the focus of several federal educational programs for children, including Head Start as well as Title I (since 1965) and Chapter I (since 1981). These programs are intended to compensate for the effects of social disadvantages on literacy acquisition by increasing the cognitive and attitudinal preparedness of children at risk for poor academic achievement and by providing sufficient, meaningful instruction in reading, writing, and other skills to prevent children from falling behind and to assist those who do.

The stereotypic picture of illiteracy portrays an adult who, like many other members of his or her social group, did not learn to read and write adequately during the school years, even if he or she attended school regularly. Inadequate schooling, weak personal incentives for achievement, and low expectations probably contributed to the failure to learn earlier in life. When improved literacy skills are seen as important for career advancement or other personal goals (such as being able to assist one's children with schoolwork), the illiterate adult may seek help through a community-based program in which successful outcomes depend on the mature desire and willingness to learn, coupled with the sensitive guidance of an instructor who can tailor a program to the client's individual needs.

2. Traditional Assumptions Regarding Reading Disability

Reading disability refers to the failure to read adequately despite sufficient instruction, cultural advantage, and measured intelligence. The problem is assumed to stem from within the individual, rather than from the cultural or educational milieu, and to have a biological basis, even though overt neurological signs may be undetectable. It is generally presumed that some essential aspect of mental processing is miswired, and that the malfunctioning or inefficiency of this neurological subsystem impedes the normal acquisition of literacy skills. The precise nature of the underlying problem remains an issue that continues to be a focus of research in the field.

In both research and educational practice, a distinction has usually been made between underachievement and mere low achievement. Only children with poorer reading abilities than would be expected on the basis of their general aptitude are typically identified as having a reading disability or, often interchangeably, dyslexia. In contrast, poor readers, who achieve at a level that is not discrepant from their aptitude, have been termed garden variety low achievers (Gough & Tunmer, 1986). Children whose low achievement is attributable to a lack of social and educational opportunity are considered one type of garden variety poor reader; the label also applies to children who are slow learners due to low aptitude. These distinctions are founded on the assumption that the nature and causes of the different kinds of reading problems are quite dissimilar, and hence that a different approach to treatment is required for each.

A second distinction that follows from traditional etiological assumptions is between specific (or selective) and nonspecific profiles of deficits in achievement (Benton, 1978; Morrison, 1987). Dyslexia is thought to be caused by a neurological impairment that specifically interferes with the acquisition of literacy skills, but does not directly impede learning in other areas. Hence, some reserve the term reading disability or specific reading disability for children of average or above-average aptitude whose academic difficulties are confined to reading and writing; in contrast, many believe that across-the-board underachievement is more suggestive of some other basis, such as emotional or attentional problems, than of a localized deficit in neurocognitive processing. Equally poor performance in mathematics, as in reading and spelling, is also usually seen as more characteristic of garden variety slow learners than of true dyslexics.

The conceptualization, identification, and treatment of reading disabilities have traditionally focused on the school years, particularly the elementary grades during which the child's difficulties first become apparent. It is usually the classroom teacher's responsibility to identify children who have more difficulty learning to read than their classmates. A detailed diagnostic evaluation is then conducted by educational professionals. In the years following the 1977 passage of P. L. 94-142, which mandated special educational provisions for all handicaps (including learning disabilities), most states followed the federal lead in using a discrepancy between aptitude and achievement as the primary basis for differentiating reading disabilities from other varieties of low reading achievement (Frankenberger & Fronzaglio, 1991; Mercer, Hughes, & Mercer, 1985). Sensory handicaps, emotional disorders, mental retardation, and disadvantaged backgrounds are also sometimes used as exclusionary criteria that may preclude a child from being considered learning disabled. If, according to state and local guidelines, a child is determined to be learning disabled, a specialized plan of instruction must be designed and implemented according to the child's level of need.

The primary responsibility for providing special education for children with reading disabilities has traditionally rested with neighborhood schools, although more affluent families have often sought help privately as well. Special private schools for children with severe learning disabilities have existed in the U.S. for many decades. Remedial programs typically have focused on reading skills, although some approaches have incorporated training in component abilities suspected to underlie reading problems. Moreover, because a neurological deficit is posited, instructors often presume that some reading and writing skills cannot be acquired in the normal manner and that efforts must be directed to help the child develop alternative strategies to reach the goal of skilled reading. Often, special training or state certification is required for qualification as a provider of special instruction for reading disability.

Finally, it has been presumed that with appropriate remedial instruction, most bright and advantaged children will not become illiterate, but will eventually learn to read adequately, although some degree of persisting difficulty with spelling and reading speed may be unavoidable due to the underlying neurological limitation. Indeed, parents have been reassured of the positive prognosis by the evident success achieved by prominent individuals who were thought to have childhood reading disabilities, such as Thomas Edison, Albert Einstein, and Nelson Rockefeller. Hence, there has traditionally been little consideration by researchers or practitioners of reading disabilities in adulthood, and it has not been deemed necessary to establish criteria for diagnosing adult reading disabilities.

The stereotypic picture of reading disability portrays a child who, unlike her or his classmates, exhibits a specific weakness in reading achievement that cannot be attributed to social disadvantage, low aptitude, weak motivation, or inadequate instruction, and that probably results instead from an intrinsic, biological difference that makes learning to read a particularly difficult task. This child's problem probably has been identified and treated by professional educators and has been expected to be largely overcome in childhood.

B. Recent Challenges to Traditional Assumptions

The fundamental differences in how illiteracy and reading disability have tended to be conceived, diagnosed, and treated are summarized in Table 1. At first glance, it appears that the differences are irreconcilable and that illiterate and reading-disabled individuals might have virtually nothing in common except for poor reading and writing abilities. Some recent advances in understanding both groups, however, suggest that the differences may not ultimately be as wide as they appear at either a practical or theoretical level. In this section, the increasing diversity and changing needs of adults who seek help with literacy problems are examined; then questions are raised regarding the characteristics and adult outcomes associated with reading disability.

1. Changes within the Adult Literacy Field: Diversity and Individual Differences

As the 21st century approaches, the role of literacy in the lives of society's adults has been changing. Consequently, definitions of what it means to be literate have been, and will continue to be, altered from the point of view both of the individual adult and of the providers of services to adults with literacy problems. The increasing sophistication of and reliance on technology in modern life underlie these changes.

Ironically, strong literacy skills are becoming both more necessary and potentially less necessary than in the past. On one hand, in today's multimedia society, many daily functions can be accomplished without any reading or writing skills. News, information, and entertainment are widely available by listening to the radio and watching television. Instructions for acquiring skills and information (carpentry, cooking, gardening, science, travel, etc.) can be obtained on videotape in lieu of in a written manual or book. Business and personal communication can take place orally and can be recorded on tape. Likewise, construction workers, hotel maids, and other workers with weak literacy skills can interact with computers by touching pictures on a screen or by speaking and receiving vocal commands (Bulkeley, 1992). All of this would suggest that the literacy needs of our citizens should be decreasing, as society seems to be becoming post-literate.

Table 1. A Comparison of the Traditional Assumptions Regarding Illiteracy and Reading Disability

	Illiteracy	Reading Disability
Root causes	social disadvantage	neurological difference
Proximal causes	inadequate schooling, weak motivation	deficient decoding of print, selectively impaired processing of verbal stimuli
Affected population	disadvantaged groups	mainstream individuals
Achievement profile	nonspecific low achievement	low achievement confined to reading and writing
Usual Basis for Identification		
(1) In Childhood	family background	teacher-referred, school-classified on basis of discrepancy between aptitude and achievement
(2) In Adulthood	self-referred	childhood history of reading disability
Treatment	adult literacy programs, Chapter 1, Head Start	special education services

On the other hand, fewer jobs can be successfully completed with rudimentary reading and writing skills. Opportunities for unskilled and manual labor are becoming rarer in the U.S. because such tasks can be accomplished elsewhere in the world at lower cost to American companies, and many tasks previously accomplished by manual labor are now carried out by machines. An increasing proportion of private and public companies and institutions provide intangible services rather than tangible products. Thus, managing information and other technology-related skills are increasingly essential for employment, particularly in jobs that ensure middle-class lifestyles and benefits. Even previously manual jobs, such as working on a manufacturing production line, operating machine tools or delivering goods, now involve more interaction between humans and machines, and thus require new literacy abilities, such as reading computer output. Because literacy is defined functionally as the degree of skill necessary to maintain employment and function in society, reading and writing ability levels that would have been considered literate in the recent past are often no longer adequate for obtaining and maintaining employment. It is now estimated that the equivalent of

twelfth-grade reading skills may now roughly correspond to the minimum requirement for functional literacy (Aaron, Chall, Durkin, Goodman, & Strickland, 1990; Chall, Heron, & Hilferty, 1987; Miller, 1988; Stedman & Kaestle, 1987). Whereas in the past, illiteracy implied a lack of basic word recognition abilities, such as reading signs and labels or completing a job application form, today the functionally literate adult must be able to deal with more complicated literacy tasks, such as reading legal contracts, filing and retrieving documents, and issuing commands to a computer. Illiteracy in late 20th century America might be better termed low literacy or semi-literacy (Miller, 1988). As Stedman and Kaestle expressed it, "although only a small percentage of people are utterly illiterate, literacy problems pervade the society" (1987, p. 27).

Because literacy standards rise, so do the challenges facing providers of adult literacy services. More adults find that although they think of themselves as able to read and write, they need to improve skills to compete with colleagues who can read faster, understand more deeply, and write more clearly, and who have successfully earned more advanced educational degrees. The population of adults seeking help has become more heterogeneous in their initial abilities and in the levels of skill to which they aspire. Although adults with disadvantaged backgrounds are still disproportionately represented, the population of adults with literacy problems has also become more diverse with regard to socioeconomic background. Whereas the goal of literacy programs in the past has often been to meet the needs of individuals who had very little exposure to written language by providing them with basic word recognition skills, today's adult literacy educators must now meet the needs of individuals with many more years of education and literacy experience by providing them with high level reading comprehension and writing skills. Increasingly, whether from disadvantaged backgrounds or not, these individuals are people who failed in their attempts to become skilled readers despite standard educational opportunities.

Although the majority of those seeking assistance consist of self-referred individuals, there is also a trend for individuals to have been identified and referred by institutions. Assessments of adult literacy are often conducted in the military services, some correctional institutions, in the workplace, and in colleges. Often, for those identified as having poor reading and writing skills, participation in a literacy improvement program is becoming mandatory rather than voluntary, because continued employment or college enrollment may be contingent upon achieving a higher level of skill. In some locations, enrollment in adult literacy programs is also required to maintain eligibility for welfare support.

The provision of literacy instruction for adults has also begun to shift gradually from primarily community-based centers to institution-run programs. For instance, as employers discovered that it was becoming harder to find sufficiently skilled workers to fill available jobs, some began to offer literacy programs to upgrade the skills of their existing employees. Often these programs can be specifically tailored to the precise literacy needs within a company or industry. Unlike many traditional programs, these are often conducted at the work site, and are led by hired literacy experts. Adult literacy training, in short, is no longer confined almost exclusively to volunteer efforts within disadvantaged communities, although the need for those programs has never been greater.

For some younger adults, literacy skills may be insufficient because the requirements necessary to obtain a high school diploma have been scaled back; a diploma no longer guarantees a level of reading and writing competence sufficient for college-level academic work or for non-manual employment. As a consequence, both four-year and especially two-year colleges have tried to provide more academic foundations training in reading, writing, and study skills. Again, it is the functional needs presented by these young adults, not just a background of disadvantage, that defines the population served by such programs.

In addition to the increasing diversity of adults seeking help, there are other new challenges facing providers of adult literacy instruction. Of particular relevance to the topic at hand is the growing acknowledgment of individual differences not only in initial skill levels and functional needs, but also in response to instruction. As noted earlier, it has traditionally been assumed that when low literacy is the result of a lack of educational opportunity, all that is required for remediation is the provision of adequate instruction to a motivated individual

in a supportive and meaningful context. Even programs that mainly serve adults from socially disadvantaged backgrounds have come to recognize, however, that learning does not always progress rapidly and easily under such circumstances. This has prompted some concern about the possibility that some, perhaps many, of the adults seeking help today are hindered by an intrinsic reading disability, and that those individuals' problems may be more intractable or may require different instructional methods than those arising simply from lack of educational opportunity. Widely varying estimates (from 30% to 80%) have been made of the prevalence of specific reading disability among adults served by literacy improvement programs (Malcolm, Polatajko, & Simons, 1990), but there is agreement that the proportion is significant. Consequently, there is increased interest on the part of the adult literacy community about current theories, findings, and treatment of reading disability.

2. Changes Within the Reading Disabilities Field: Validity and Reliability of Diagnoses, Matthew Effects, and Long-term Persistence

As noted, it was traditionally presumed that discrepancy- based, specific reading disability and garden variety poor reading have distinctly different etiologies, characteristics, and educational requirements. One basis for this distinction was, and to some extent continues to be, that both clinicians and researchers (as well as lay persons) feel strongly that children who are just slow learners--i.e., whose low achievement in reading and writing is commensurate with their low achievement and aptitude in other respects-- and children whose reading levels reflect a lack of educational opportunity, are more common and more understandable than children with a specific reading disability. In other words, a stark dissociation between aptitude and reading achievement, in and of itself, is sufficiently rare and interesting to be considered by many to be a distinct problem that must be traceable to an isolated underlying deficit or difference in processing (Crowder & Wagner, 1992; Frith, 1985). Furthermore, because such children tend to be bright, and because they have experienced success in learning other subjects, it is presumed that these strengths can be effectively called upon in treating reading disability but not other kinds of reading problems.

Consistent with these intuitively held views, some early findings indicated that, in comparison to garden variety poor readers, children with specific reading disability were about four times as likely to be male, made smaller gains over time in reading achievement despite larger gains in mathematics achievement, and were more prevalent than would be expected on statistical grounds if one did not assume that students with a specific reading disability were a distinct segment of the population (e.g., Yule, Rutter, Berger & Thompson, 1974; Rutter & Yule, 1975). Early research, based on the hypothesis that deficient interhemispheric integration in the brain is the root cause of dyslexia, also suggested that these children were especially likely to be left-handed, and that they made characteristic directional errors, such as reversing the orientations of letters and the order of letters within words, during reading and spelling (Orton, 1937). These early claims have been scrutinized in recent years, and each has been weakened by contrary empirical evidence. For instance, it is now clear that a strong preponderance of males is rarely seen in objectively defined samples (Naiden, 1976; Pennington & Smith, 1991; Shaywitz, Shaywitz, Fletcher & Escobar, 1990) and that neither left-handedness nor reversal errors are strongly associated with reading disability (Annett & Manning, 1990; Collette, 1979; Nelson, 1980; Pennington, Smith, Kimberling, Green & Haith, 1987; Taylor, Satz & Friel, 1979). Persuasive alternative accounts of the distributional data on the incidence of achievement-aptitude discrepancies are also now widely accepted (Rodgers, 1983; van der Wissel & Zegers, 1988).

It should be noted, however, that while the existence of these purported differences would support the hypothesized distinction, their non-occurrence does not dictate against it (Ellis, 1985; Frith, 1980). For example, while different sex ratios suggest distinct etiologies, equivalent sex ratios are equally consistent with hypotheses for and against the distinction, because the very same surface characteristics can arise for different reasons. By emphasizing the similarities, it is not meant to dismiss this possibility.

It has also traditionally been presumed that the process by which reading is acquired, and hence the nature of the reading process itself, is disrupted differently for children with true reading disabilities than for generally slow learners. It has become increasingly clear from recent research, however, that the way poor readers read is

remarkably similar in many respects, regardless of whether the child has a specific or garden variety profile. As will be reviewed in Section IV below, a large body of evidence has been accumulated showing that the aspects of reading that are most problematic, the kinds of errors that are made, the cognitive-linguistic processes that are also impaired, and the effectiveness of various intervention procedures are rarely found to be notably different for the two kinds of poor readers. Consequently, even though it is still possible that there may be important etiological differences underlying specific reading disability and other types of poor reading, the nature of the problems themselves may be so similar as to make the distinction of little practical importance.

Furthermore, in actual practice, the distinction between underachievement and generally low achievement is apparently not adhered to. That is, schools are expected to provide different educational services for different groups of low achieving children--regular classroom instruction for garden variety slow learners, compensatory (Title I, Chapter 1) programs for children whose low achievement is attributed to concomitants of social disadvantage and special education programs for children with true reading disabilities. In actuality, however, the differences between regular, compensatory, and special education programs with regard to the assumptions about causes, prognoses, and instructional needs, have become quite blurred. Several studies have shown that the purported eligibility criteria for learning disability classifications are actually not met in perhaps as many as half of the children who receive such classifications, and conversely that many children who do meet strict discrepancy-based criteria for a specific reading disability are not provided special education services, even when their reading skills are as poor as children from the same schools who are so classified (McGill-Franzen, 1987; Rivers & Smith, 1988; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992; Ysseldyke, Algozzine, Shinn & McGue, 1982). Instead, students in need of help are assigned to programs in which teachers perceive they will be better off, regardless of whether the child is technically eligible for that program (Moore, Hyde, Blair & Weitzman, 1981).

The proportion of poor readers who receive special education for a learning disability has more than doubled in the past 15 years, while the proportion in compensatory programs has shrunk correspondingly (McGill-Franzen, 1987; Frankenberger & Fronzaglio, 1991). Perhaps it is not surprising, therefore, that there appear to be few meaningful differences in the types of instruction provided or in the levels of performance achieved in regular, compensatory, and special education programs (Hallahan & Kauffman, 1978; Ysseldyke et al., 1982). Practically speaking, therefore, by calling a slow learner or disadvantaged child learning disabled, that child may have access to better funded programs at the elementary level, and may later be entitled to special considerations (e.g., untimed examinations, oral rather than written assignments) that allow at least the appearance of a successful completion of secondary schooling. The upshot is that as today's children become adults, their educational histories will provide little clue as to the true nature of their childhood reading problems.

Another trend in recent research on reading disabilities is the growing consideration of so-called Matthew effects (Stanovich, 1986; Walberg & Tsai, 1983). That is, it is now acknowledged that having a reading problem can have many negative consequences for a child, and that those consequences may interact and tend to accumulate over the school years. For example, because the child is likely to receive different instruction, less challenging and probably fewer kinds of reading materials will be read, leading to progressively less exposure to print over time (Allington, 1983). Because reading itself is an important route to learning vocabulary and general information (Fielding, Wilson & Anderson, 1986; Nagy, Herman & Anderson, 1985), the child is likely to show slower acquisition of these skills also. Because IQ scores reflect acquired knowledge of this sort, measured IQ may decline (Bishop & Butterworth, 1980) to the point that the child with an initially large aptitude-achievement discrepancy may appear later to be a garden variety poor reader. Similarly, because achievement in other subject areas (math, science, social studies) increasingly depends on reading and writing abilities, performance in these previously stronger areas may begin to suffer, perhaps to the point that the child who initially had a specific problem now exhibits an across-the-board achievement deficit profile. Later on, moreover, the adolescent with reading problems may be placed in lower academic tracks, may be discouraged from pursuing demanding careers, or may otherwise be made aware that others have lower expectations for his or her vocational success.

In addition to the educational and cognitive consequences of early reading problems, there are probably affective and interpersonal sequelae as well. Teachers, parents, and classmates may come to alter their perceptions and expectations, and this does not go unnoticed by the child. Lowered feelings of self-worth, reduced motivation to learn, school conduct problems, and a host of other personal problems would be likely consequences of such perceptions, and indeed such sequelae have indeed been found to be associated with reading problems (Juel, 1988; Oka & Paris, 1987). In short, even for children with specific reading disability, Matthew effects may serve to expand an initially isolated problem into a pervasive one, which may be indistinguishable in breadth and depth from the stereotypical cluster of motivational, skill, and interpersonal problems that had previously only been associated with generally slow learning or lack of educational opportunity. Again, in practice if not in theory, there may be little reason to differentiate specific reading disability from other kinds of poor reading.

Another change in the reading disabilities field is increased interest in the study and treatment of dyslexic adults. Some of the new research has been conducted in a behavior genetics context, in which family aggregation of reading problems has been studied to test models of genetic transmission. This research and other work which has directly addressed the questions about the diagnosis and characteristics of adults with current or past reading problems will be discussed in Section V. Suffice to say here that there is considerable evidence that individuals who had childhood reading problems continue to have weaker reading and spelling skills as adults, compared to peers whose backgrounds were similar in other respects. On the practical side, there appears to be an increase in requests by adults for identification and treatment of their reading disabilities. For some of these adults, the goal is not so much to improve their skills but to give a name to, and explain, their lifelong problems. Because a learning disability classification was unusual prior to the passage of P. L. 94-142 in 1977, very few adults now in their thirties or older were ever so classified, so many wish to be retrospectively. For those generations of students, poor readers were unfortunately often perceived as stupid or just lazy. For some, it is a great source of satisfaction to finally be able to say that they had or have dyslexia. Whether such individuals can, or should, be differentiated from other adults seeking literacy instruction will be discussed later.

3. Summary of Converging Trends

In response to broader changes in workplace requirements and educational standards, the population of adults served by literacy improvement programs is steadily becoming more diverse with regard to initial reading level, socioeconomic background, and educational history. More of them, furthermore, are observed to have unusual difficulties in improving their skills despite apparently adequate motivation and assistance, a pattern that is suggestive of the traditional conception of a specific reading disability.

Paradoxically, however, traditional assumptions about the validity of the distinction between specific and nonspecific reading problems with regard to causes, correlates, and consequences have been difficult to substantiate in research on children with poor reading achievement. It is also quite clear that whether or not the reading problem is initially specific and discrepant from aptitude, many forces can operate over time to produce a broader profile of weaknesses in achievement, cognitive processes, motivation, and so forth. That the persistence and broadening of problems does not end in childhood has also been documented in recent studies of adults with past or current reading disabilities.

In short, even if all traditional etiological assumptions about the differences among dyslexic children, disadvantaged children, and slow learning child are correct--and it may be premature to claim otherwise--it is nevertheless the case that the older they get, the more reading-disabled children will have in common with other poor readers with regard to reading processes and a host of other problems. Thus, individuals from both groups who continue to have reading problems in adulthood are likely to look very much alike and to seek help in many of the same places. The question is, therefore, whether it is possible or desirable to make differential diagnoses and provide specialized assistance in adulthood. Before addressing that question, however, the

development and treatment of reading disability in childhood, as well as recent research on the nature of adult reading disability, will be reviewed in more detail.

EOTgcf lpi 'Ces wkskqp'lp'Ej kf j qqf "

To provide a background against which to interpret the reading processes and cognitive profiles of reading-disabled adults, a brief summary is needed of some important aspects of the extensive research that has been carried out in recent decades on the nature of skilled reading and the process of reading acquisition. The characteristic problems faced by children who have difficulty learning to read are reviewed in the section that follows.

1. Processes Involved in Skilled Reading

Although there are many theoretical issues yet to be fully resolved about how reading is accomplished and how children become skilled readers, there are many points on which the research community is generally agreed. Some of the major terms and ideas pertaining to these issues are introduced.

First, the goal of reading is comprehension. Despite occasional attempts to make this guiding assumption into an issue of controversy, few would disagree that the ultimate goal of reading is to understand written material in order to achieve some purpose. In other words, people read not to decipher a code, but instead to gain knowledge, to be entertained, and so forth. A good reader is thus someone who readily gains a great deal of information from text. Defining reading comprehension formally can be a complicated issue, given the various contents, structures, and genres of different reading materials and reading tasks. For our purposes, however, it is sufficient to say merely that to comprehend is to obtain desired information by reading a particular text, so that what one has comprehended can be exhibited by paraphrasing or answering questions about what was read.

Second, most contemporary models point to two abilities as the major components of reading: (1) determining which words are represented in print, i.e., word recognition, and (2) understanding the meanings of the words and the propositions conveyed by the phrases, sentences, and higher order structures into which the words are combined, i.e., language comprehension. Both word recognition and language comprehension are necessary for reading success, and neither alone is sufficient for extracting meaning from print. Furthermore, each of these components involves several elements of skill. Skilled word recognition, for instance, depends on seeing and identifying letters and spaces on the printed page, understanding the correspondences between letter sequences, called graphemes, and spoken sounds, called phonemes, using these regularities to decode printed words into their spoken counterparts, knowing that the written forms of some irregular words do not conform to these grapheme-phoneme correspondence regularities, and applying what one knows about letters, letter-sound relations, and word-specific knowledge to identify words in a rapid and efficient, or automatized, manner. Skilled language comprehension, on the other hand, depends on knowing the meanings of words, analyzing the syntactic and semantic structures of word combinations, using one's background store of information about the topic being discussed, using logical inferential abilities, and so forth. Both comprehension and word recognition also clearly require such general cognitive capabilities as attention and memory.

Third, although there is agreement that word recognition and oral comprehension are the cornerstones of reading, theoretical models differ with regard to the relative importance and independence of these two components. At one extreme, there are bottom-up models, in which the reading comprehension process exactly parallels the listening comprehension process, such that the only difference between listening and reading is that the latter first requires recognition of printed words (Venezky, 1976). The main challenge in reading acquisition, therefore, is simply to discover how to map printed text onto one's existing oral language system. According to such models, reading instruction should be focused first on developing the skills involved in word recognition and then on promoting speed and fluency of those processes. At the opposite extreme are top-down models, in which word recognition is seen not merely as a one-way process of mapping print onto speech, but is also itself greatly influenced by contextual factors (Goodman, 1967; Smith, 1971). According to this viewpoint,

therefore, reading instruction ought to focus not just on decoding in isolation, but on learning to recognize words in context in order to make educated guesses--based on semantic, syntactic, and topic knowledge--as to the identity of particular words.

The arguments raised by theorists at both extremes can be appreciated and incorporated into an interactive view in which word recognition and listening comprehension are seen as largely separable--but to some extent also interactive and interdependent--components of reading. This study has been influenced by the view of reading advanced by Gough and his colleagues (Gough & Tunmer, 1986; Hoover & Gough, 1990), who examined the relative contributions of component skills to explaining developmental and individual differences in reading ability. In an interesting series of studies, these researchers have demonstrated that from 73% (at Grade 1) to 90% of the variance in reading comprehension scores can be accounted for by the combination of just two factors: how well children can decode (as measured by pseudoword reading), and how well they understand oral language (as measured by the accuracy of responses to questions about stories they heard). Evidence that both decoding and listening comprehension are the primary determinants of reading comprehension has also been provided by Singer and Crouse (1981), Stanovich, Cunningham and Feeman (1984), and others.

Moreover, although the independent contributions of lower-level word recognition and higher-level oral comprehension to skilled reading account for a great deal of the total variance, Hoover and Gough (1990) also showed that a significant additional contribution to prediction was nevertheless made when an interaction term was included in the analysis, apparently reflecting the several ways that strengths or weaknesses in one component process can hinder or facilitate the operation of the other. Much evidence has accrued regarding these direct and interactive effects of decoding and comprehension on reading, as follows.

2. Word Recognition and Listening Comprehension in Relation to Each Other and to Reading Comprehension

It should be clear on purely logical grounds that if one cannot identify the printed words on a page, extracting meaning will be virtually impossible. While this basic relationship is easily appreciated, what is sometimes overlooked is the importance of the efficiency with which word recognition is accomplished. Some children, for instance, are able to decode individual words quite accurately, but nevertheless fail to derive meaning from text adequately. One possible reason for this is a lack of automaticity in decoding. If it takes an inordinate amount of time and effort for the child to apply knowledge of grapheme-phoneme correspondences and word-specific memories to identify printed words, the word recognition process will proceed so slowly and in such piecemeal fashion that a good representation of the sequence of identified words may not be established in memory, and therefore not be available for meaningful interpretation. This kind of bottleneck, stemming from inefficient low-level processing, is one important interaction between the major components of reading (Perfetti, 1985; Perfetti & Lesgold, 1977; see also Crain & Shankweiler, 1988; and Shankweiler & Crain, 1986).

The limitation placed on comprehension by weaknesses in decoding leads to an interesting trade-off function with regard to the relative contributions of the two components to reading comprehension at different levels of ability. As Sticht et al. (Sticht, Beck, Hauke, Kleiman, & James, 1974) observed, as long as decoding is not automatized, reading comprehension performance will lag behind oral comprehension performance because the process of recognizing individual words is so laborious as to impede understanding. As automaticity starts to be achieved, which typically corresponds to about the fourth-grade level of word recognition skill, the reader's cognitive resources are not consumed to such a degree by low-level processing, and there is a shift that Sticht described as from learning to read to reading to learn. Increasingly, therefore, reading and listening comprehension levels would ordinarily become more similar once the bottleneck created by effortful decoding is removed. In sum, as reading skill progresses, there is a shift in the relative importance of the component processes, with word recognition playing a much larger role in determining individual differences during the earlier, rather than later, stages of reading acquisition (Curtis, 1980; Palmer, MacLeod, Hunt, & Davidson, 1985; Sticht & James, 1984).

Reading comprehension is also limited by listening comprehension abilities, particularly for skilled readers. Clearly, fully accurate decoding of words will not ensure comprehension, and comprehension is virtually impossible unless the material would be comprehensible if it were heard rather than read. (For example, one could read aloud most of the text in *Biochemical Abstracts* but would understand little of what was read). Like oral comprehension, therefore, reading comprehension will be unsuccessful if the meanings of words are not accessed or known, if syntactic and semantic relationships are inaccurately analyzed, and so forth. Of particular importance is familiarity with the topic being discussed in text (or speech). So-called schema effects, referring to the facilitation of understanding and processing when material is familiar, have long been recognized in cognitive psychology (Bartlett, 1932). With regard to reading, it is quite clear that an individual's knowledge base can limit or enhance the extraction of meaning from text. In one study, for instance, Pearson, Hansen and Gordon (1979) showed that second graders who had greater domain-specific background knowledge about the topics of particular reading passages exhibited greater comprehension of those passages than did classmates of equivalent IQ and general reading ability who were less knowledgeable about those topics.

Another constraint on effective reading comprehension is experience with reading itself. Experienced readers know that there are many kinds of reading material (narrative, expository, and so forth), and that certain forms and conventions are associated with each. Moreover, with experience, one learns that material can be read for different purposes, and that the way one processes the text can be adjusted accordingly. Beginning readers need to learn to recognize these sorts of differences and develop some metacognitive strategies for dealing with them (Brown, Armbruster, & Baker, 1986). For example, children must learn to monitor their comprehension levels, reduce their reading speed if necessary to maintain adequate understanding, increase their speed if the goal is just to skim the text, take notes as an external aid to discovering or retaining the structure of the text, and so forth. As Adams (1990) concluded, true understanding of a text is not automatic but requires critical and inferential thought. Consequently, comprehension is an active and effortful application of one's cognitive resources and will be "only as fruitful as the discipline and effort that the reader invests in it" (p. 142). The top-down application of strategies and background knowledge affects not just oral and written comprehension but also, albeit to a lesser extent, the recognition of printed words. Clearly, when faced with the task of reading a word in isolation, the reader must rely solely on letter-sound correspondences and memorized spellings. When words are encountered in connected text, however, the reader can also use the context as a clue to identification. If so, contextually appropriate words are more easily and quickly recognized than incongruous words, as has been demonstrated in many studies (Rumelhart, 1977; Posner & Snyder, 1975; Stanovich & West, 1983). Children whose decoding skills are still shaky have been found to rely heavily on such contextual cues as an aid to recognizing words, particularly those with irregular spelling patterns (Adams & Huggins, 1985; Gough & Hillinger, 1980; Jorm & Share, 1983).

However, Gough (1983) pointed out that, even under ideal conditions, the context rarely determines absolutely what a word will be but only narrows the pool of possible words. He estimated that the predictability of content words (such as nouns and verbs) is only about 10% and the predictability of function words (such as articles and prepositions) is only about 40%. It is perhaps not surprising, therefore, that relying on such inexact cues to a word's identity is more characteristic of novice readers than expert readers. In fact, the greater a reader's level of skill, the less it appears that contextual cues are used, except in particularly difficult situations, such as when reading material is presented especially slowly or in a degraded form (Adams, 1990; Gough, 1983; Perfetti, 1985; Stanovich, 1980). The eye movements of novice and skilled readers are consistent with this apparent change in the role of context as a function of skill; that is, it is the most proficient readers who look, albeit very briefly, at every word, and the least skilled who explore the text less systematically (Rayner & Pollatsek, 1987). In short, the use of context as an aid to word recognition is one kind of interaction between the main components of reading, but this interactive effect appears to be most important for less skilled readers.

A more powerful influence on the accuracy and efficiency of word recognition is familiarity, practice, and instruction in identifying particular words. Simply put, words that an individual has read before are read more easily and more quickly than words that are encountered for the first time. More generally, words that occur with high frequency in text tend to be recognized more quickly than words of lower frequency. (For reviews of

this research, see Adams, 1990; Carr & Pollatsek, 1985; Seidenberg & McClelland, 1989). Prior experience and familiarity are particularly important for the recognition of irregular or exception words, whose pronunciations cannot be decoded simply by applying letter-sound correspondence rules. In English, there are many such words that young children must learn to recognize simply on sight (e.g., of, laugh, who). With regard to achieving automaticity, furthermore, it is clear that the speed and accuracy with which words can be identified increases with practice and lays the foundation for skilled reading comprehension.

Although contextual cues and word familiarity facilitate word recognition, the most powerful influence on the identification of printed words is undeniably the ability to decode according to systematic correspondences between letters and sounds. For both skilled and beginning readers, it is only by decoding that one can potentially determine the identity of a word that has not previously been read, and hence for which no memorized image of its printed form exists. As Gough and Hillinger (1980) stated, learning to decode is an important step for beginning readers because their major task is:

....accessing the mental lexicon for known words that have never before been seen in print. If the novice can derive appropriate phonological representations for such novel printed inputs, then a lexicon already accessible on the basis of phonological codes through the course of language acquisition, can also begin to be accessed on the basis of print. (p. 131)

From the start, children are continually expected to read a great many new words; in fact, it is estimated that approximately 35% to 45% of the words in elementary school reading books appear only once (Jorm & Share, 1983). Also, while the identification of known words can, in principle, be achieved instead via sight recognition of a memorized visual pattern, there appear to be limits to the utility of relying exclusively on memorization of individual words (other than irregular forms). It is generally estimated that a child can acquire up to a fourth-grade reading vocabulary without decoding, but that progress beyond that level depends crucially on decoding skills. At all ages, it should be noted, the ability to decode pseudowords--to which previous lexical knowledge cannot be brought to bear--is very highly correlated (typically 85% to 95%) with the ability to read real words.

The evidence that knowledge of letter-sound correspondences is crucially related to successful reading acquisition is overwhelming at this point, and several comprehensive reviews of this material are available (see Adams, 1990; Tunmer & Hoover, 1992). Of particular interest are several longitudinal studies. Jorm, Share, Maclean, and Matthews (1986) found that first graders with greater phonological decoding abilities later attained higher levels of reading achievement than children with a weaker grasp of letter-sound correspondences who were similar in many other important respects, such as sight word vocabulary, verbal intelligence, gender, and schooling. Juel (1988), who studied a large sample of children from disadvantaged backgrounds, also found a strong relationship between decoding abilities in the first grade and later reading skills. Gough and Walsh (1991) noted that higher levels of pseudoword decoding skill led to faster acquisition of irregular as well as regular words. In short, the road to successful reading begins with a grasp of the relationship between printed letters and spoken sounds, and the application of that knowledge to the decoding of written material.

3. Phonological Analysis of Speech and Phonological Decoding of Print

To understand fully the constellation of skills that must be acquired in learning to read, an examination is needed of what underlies decoding itself. As noted earlier, decoding involves the mapping of letters onto phonemes, the sound elements that make up spoken words. It is important to note it is only for alphabetic writing systems (like that for English) that phoneme-grapheme correspondences are the fundamental basis for word recognition; in some languages, graphic symbols stand for syllables, morphemes, or entire words. It is also important to mention that reading acquisition is very different in many respects from oral language acquisition. Spoken language is acquired successfully and relatively effortlessly starting from an early age by nearly every child around the world. Literacy, in contrast, is not a universal aspect of human culture, is rarely learned before age five, almost always requires explicit instruction and deliberate effort, and is mastered with varying degrees of success by different children. Furthermore, it is clear that an appreciation of the fact that spoken words

consist of sequences of smaller sounds is not something that children ordinarily develop just from their experience with spoken language. In short, alphabet literacy is not a naturally developing human faculty, but rather one that was invented by humans and one that requires the unnatural facility to analyze spoken words into phonemes. It is this aspect of phonological processing that is crucial to decoding, and thus poses the greatest initial challenge for the beginning reader.

What makes phonological analysis so unnatural and difficult? Most adults are so used to thinking that the letters of the alphabet stand for the sounds of speech that they fail to remember that this is actually not readily apparent. In fact, those sounds are embedded in a very complex speech stream that, for the child, is not immediately accessible to conscious analysis. Many phonemes cannot actually be heard or pronounced in isolation; for instance, try to say just the first sound in *too* without any vocalic element following it. Acoustic analyses indicate that it is impossible to isolate just the consonantal portion from the following vowel without making it unrecognizable. What is left turns out to be a chirp that sounds not at all like language. Not only is the speech stream not readily segmentable into a string of phonemes, but the acoustic characteristics of phonemes vary considerably depending on the context in which the phoneme occurs. For instance, the sound of the first phonemes of *too* and *top* are rather different to the ear; it is the brain that analyzes this complex information to recognize that the same phoneme has been produced. For a fuller introduction to these issues, reviews are available by Gleitman and Rozin (1977), and Liberman, Shankweiler, and Liberman (1989).

Becoming proficient at producing and listening to oral language does not require any conscious analysis of the phonemic structures of spoken words. Learning to read, however, does require this metalinguistic skill, which is often termed phoneme awareness. Not until the child achieves the insight that words are composed of phonemic units can the child understand what letters actually stand for, and hence grasp the regular correspondence between letters and sounds. A great deal of research in the past two decades has demonstrated that preschool children lack full phoneme awareness and that differences among children in their metalinguistic understanding of phonological structure are related to their acquisition of decoding skills in the process of learning to read. For example, Liberman, Shankweiler, Fischer, and Carter (1974) showed that most 5-year-olds are unable to tell you that there are three sounds in the word *cat*, but that about half of all 6-year-olds and nearly all 7-year-olds are able to do so. Similarly, there are marked increases with age from late preschool into grade school in metalinguistic abilities, such as judging whether two words begin with the same sound, categorizing words according to phonemic similarity, pronouncing a word without its first phoneme, and so forth. Moreover, there is abundant evidence that children's early reading abilities are reliably related to individual differences in phonological awareness skill. Correlations between achievement scores and metaphonological abilities have ranged from about 35% to 65% across studies, and are typically among the strongest predictors of reading achievement (Stanovich, Cunningham, & Cramer, 1984; Yopp, 1988; Wagner, 1988).

Although it was originally conceived that this metalinguistic insight preceded and permitted alphabetic literacy, several studies have suggested that phoneme awareness is sufficiently unnatural that it does not ordinarily develop unless the child has some experience with an alphabetic writing system. For example, very weak phonological analysis skills were seen among illiterate members of a Portuguese community who had not been exposed to written language (Morais, Cary, Alegria, & Bertelson, 1979) and among educated readers of nonalphabetic written languages such as Chinese (Read, Zhang, Nie, & Ding, 1986). Further research has indicated that the achievement of alphabetic literacy and of phonemic awareness go hand in hand in a bi-directional process: learning letters promotes linguistic analysis, which allows for letters to make sense, which leads to further phonemic analysis, and so on (Bowey & Francis, 1991; Juel, 1988; Perfetti, Beck, Bell & Hughes, 1987). A particularly interesting demonstration of this interaction was a large-scale study of disadvantaged first graders which indicated that although phonics was the most effective form of reading instruction, even this approach was effective only when the child began the year with an underlying grasp of phoneme awareness (Juel, Griffith, & Gough, 1986). Careful longitudinal studies suggest that, under normal circumstances, between the ages of about two and six years of age, children first become aware that words contain larger sub-units than the phoneme (e.g., such that rhyming relations, based on the identity of the entire

end portions of words, can be appreciated), then become able to isolate phonemic onsets, and finally achieve full phonemic segmentation across all portions of words (Fowler, 1991).

The process of acquiring a general awareness of the phonological structure of words is probably initiated in the course of language play (Mann, 1991), but fine-grained phonemic segmentation is most likely to be the result of orthographic contact (Bradley & Bryant, 1983; Bowey & Francis, 1991). Acquisition does not appear to be constrained by any biologically sensitive period, insofar as adults have been shown to develop phoneme awareness upon exposure to an alphabetic written language (Morais et al., 1979; Read et al., 1986). Several studies have also demonstrated that phonological analysis is a trainable skill in childhood as well. With appropriate and systematic instruction, considerable improvement has been seen in many children who lack phoneme awareness at school entry, and such training has led to demonstrable gains in later decoding skill compared to children who do not receive such training (Ball & Blachman, 1991; Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988). Finally, it should be noted that phoneme awareness is not an all-or-nothing phenomenon; long after the beginning reader is able to segment cat into its three components, he or she may still lack conscious access to the phonemic structure of catastrophe. In short, both phonemic awareness and decoding skills gradually improve during the course of learning to become a skilled reader.

4. The Sequence of Development

The preceding sections presented material that might suggest a necessary sequence of development. It was argued that phoneme awareness is necessary for decoding, that decoding is necessary for accurate and efficient word recognition, and that skilled word recognition is essential for good reading comprehension. Despite these contingencies, it is important to note that there is little evidence that these steps are, or should be, acquired in such an ordered fashion. In fact, a number of studies have indicated just the opposite. That is, while decoding entails phoneme awareness, the very exposure to orthography and decoding aids the acquisition of phoneme awareness (Bowey & Francis, 1991; Perfetti et al., 1987). While phonological recoding is argued to be an important step in word recognition, so, too, does sight word recognition proceed alongside and even aid phonological decoding skill (Ehri, 1992; Byrne, 1992). While greater practice in word recognition yields automaticity, initial evidence of automaticity in decoding is observed between first and second grade and continues to develop throughout adulthood (Horn & Manis, 1987). As efficient word recognition aids in comprehension, so, too, does comprehension aid the beginning reader in recognizing unknown words (Stanovich, 1980). Perhaps the most important legacy of the whole language movement is the recognition that reading acquisition is not a linear progression but is simultaneous and bi-directional from the outset. These facts do not detract from the absolute necessity of prerequisite skills in achieving full mastery of the dependent skill. Rather, they suggest that the prerequisite and result develop in complementary fashion. Studies show that in terms of instructional implications, listening comprehension should proceed alongside decoding, that word recognition may lay the foundation for decoding, and that decoding has effects on phoneme awareness. Recent research emphasizes strongly the interplay of these various components of reading and is very conservative in granting absolute developmental priority.

F 0Vj g'F gxgnr o gpv'qhtUr gekle'T gcf lpi 'F kcdkks{ 'c'pf 'Qvj gt 'T gcf lpi 'Rt qdngo u'lp'Ej kf j qqf '''

To understand the nature and causes of reading disabilities, it is necessary to examine how the process of learning to read goes awry in some individuals. In particular, a great deal of research has addressed the questions of which components of reading are most difficult for dyslexic children to master and what kinds of cognitive and linguistic weaknesses may underlie their difficulties in reading acquisition.

1. Characteristics Associated with Specific Reading Disability

As stated earlier, specific reading disability, or dyslexia, entails unexpectedly poor reading in relation to aptitude. From an educational standpoint, this state of affairs is usually only apparent after the child has received several years of formal instruction yet has not acquired age- appropriate word recognition skills by the

second or third grade. Because these children are otherwise bright and competent, earlier signs of difficulty are generally unnoticed or disregarded by teachers and parents, and indeed some dyslexic children manage to conceal their problems for a considerable time. Once most classmates have reached greater levels of skill, however, including those who are less intelligent or from more disadvantaged backgrounds, the child's specific deficiency can no longer be dismissed as a transient phenomenon. The child's record to this point reveals a consistent profile of underachievement in primary grade reading.

The first clue to the underlying basis of reading disability, therefore, is that the dyslexic child's problems exist from the beginning of the school years. Because curricula and assessments during the early grades typically emphasize word recognition much more strongly than text comprehension, the early onset of reading disability suggests that the locus of the problem lies at a relatively low level, and decades of research have indeed borne this out. As noted earlier, identifying printed words involves letter recognition, sight recognition of memorized words, and decoding through the application of letter-sound correspondences. To some extent, all of these subskills are typically weak in young dyslexic children. Over the past 20 years, however, a programmatic body of research, employing sophisticated methodologies and well-defined samples, has provided persuasive evidence that the most serious deficiency is in decoding itself. In particular, it has been shown that even after they are able to identify printed letters sufficiently well, reading-disabled children are less able to sound out pseudowords (i.e., apply letter-sound correspondence rules in the absence of word-specific memories and contextual cues) than other students, including younger, normally developing children whose overall word recognition and comprehension skills are at the same level (i.e., reading level matched controls). This kind of comparison is strong evidence that a decoding problem is not a result of generally poor word recognition skills (stemming, for example, from a visual memory deficit), but rather may be causally related to an inability to identify printed words. In short, there is a great deal of evidence that cracking the alphabetic code is the main obstacle that impedes progress in learning to read for these children.

The link between alphabetic literacy and oral phonological processing in the normal course of reading acquisition is well established. Research on reading disability has also demonstrated that weaknesses in phonemic awareness are very apparent in dyslexic children, as would be expected given their decoding problems. Several studies have shown that compared to reading level matched controls, disabled readers are less proficient in segmenting spoken words, in categorizing words according to phonemic similarity, and in performing other tasks requiring the awareness and manipulation of the sounds of oral language (Bradley & Bryant, 1978; Fowler, 1990). This link between poor phoneme awareness and poor decoding has also been shown to be a reliable basis for predicting reading acquisition differences in longitudinal studies. Of the many differences among children in the late preschool years, variability in metaphonological skill has consistently been found to predict later reading achievement more successfully than such potentially important factors as visual processing abilities, nonverbal cognitive skills, and even verbal intelligence (Blachman, 1984; Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988; Mann & Liberman, 1984). In sum, even before formal reading instruction begins, children who will turn out to have specific reading disability are likely to differ from their peers in their sensitivity to the phonological structure of spoken language, and this relative weakness in phonological processing persists in tandem with decoding difficulties during the course of reading acquisition.

Several other difficulties have also been observed in young pre-readers who become disabled readers. These include limitations in verbal short-term memory, despite adequate recall of nonverbal material (Share, Jorm, Maclean, & Matthews, 1984; Wagner et al., 1987) and slowness and inaccuracy in retrieving the names of symbols or pictures (Denckla & Rudel, 1976; Wolf, 1991). While at first glance these abilities may appear to have little in common, it has been hypothesized that the limiting factor in each task is facility with some aspect of phonological processing. That is, to retain a stimulus list in working memory or to repeat back a pseudoword, one ordinarily creates and stores a phonological representation of the items that were heard, and uses that stored information as the basis for recall. Inadequate phonological processing of stimuli could thus result in an insufficient memory representation, and hence in less accurate recall. Similarly, rapid retrieval of stimulus names is thought to depend on the accessibility and precision of phonological representations of words in memory, so weak phonological traces would impede performance on rapid naming tasks. Moreover, these

associated weaknesses could individually affect reading acquisition and reading performance directly. For instance, learning to identify printed letters, recognizing exception words and familiar words by sight, and analyzing the syntactic and semantic relations among words in connected text, all depend heavily on the adequacy of verbal memory representations. Thus, while phonological processing abilities appear to be the most fundamental source of difficulty that disrupts the learning of letter-sound correspondences, weaknesses in other aspects of word recognition and in reading comprehension may indirectly result from memory limitations that also stem from more basic phonological impairments.

So much research and thinking in recent years has been devoted to exploring the clear and important relationships between phonological weaknesses and reading disabilities that there has been a tendency to neglect some other characteristics that may also contribute to reading problems. In particular, other aspects of oral language processing, aside from phonological abilities, are also relatively weak in children who have specific reading problems (Lovett, 1987; Morice & Slaghuis, 1985; Siegel & Ryan, 1984; Vogel, 1974; Whitehouse, 1983). To some extent, the poor syntactic, semantic, and lexical abilities of dyslexic schoolchildren may be consequences of early reading failure or Matthew effects. This cannot be the whole story, however, because these linguistic deficits also appear to precede the emergence of these children's reading problems. Several longitudinal studies have found that lexical and syntactic, as well as phonological, differences among 4- to 6-year-olds, for instance, are predictive of later differences in reading achievement (Butler, Marsh, Sheppard & Sheppard, 1985; Scarborough, 1989; Share et al., 1984; Stanovich, Cunningham & Feeman, 1984). Dyslexic children have also been shown to have weaknesses in their metalinguistic ability to segment and analyze language into component words, morphemes, phrases, and sentences, suggesting that phonological awareness may be but one manifestation of a broader pattern of difficulty in conscious linguistic processing (Siegel & Ryan, 1984; Fowler, 1988; Tunmer, Nesdale & Wright, 1987). Furthermore, in one recent study that focused on the early development of children at risk for reading disability because of a family history of dyslexia, children who subsequently became disabled readers were found to have weaker language abilities than children who became good readers (Scarborough, 1991). These differences were particularly evident in the syntactic domain and emerged at a very young age (2.5 years). These results suggest that although phonological difficulties may pose the most immediate obstacle to cracking the alphabetic code, children with weak phonological skills may also be characterized by a wider array of language processing difficulties that could impede the process of learning to read.

As reading acquisition continues, the dyslexic child is likely to improve in both reading and oral skills. The initial failure in learning to decode, however, prevents most children with specific reading disability from catching up to their peers with respect to the accuracy and speed of word recognition. This lack of age-appropriate skill and automaticity, in turn, imposes a bottleneck in processing, as discussed earlier, so that the child's superior listening comprehension abilities cannot be as readily applied to the task of comprehending what is read. Consequently, performance on tests of reading comprehension is likely to be severely limited by decoding skills, as is generally characteristic of unskilled readers.

In sum, a consistent profile of reading disability has emerged that fits quite well with what has been learned about normal reading acquisition. It seems that the child with a specific reading disability suffers from subtle linguistic deficits that affect his or her ability to reflect on the phonological and syntactic structures of oral language, to decode printed words into their oral counterparts, to access lexical information rapidly, to retain phonological information in memory, to acquire a sight vocabulary, and to discover meaningful relations among strings of words that have been identified. The cognitive and linguistic problems of dyslexic children are not associated with similar difficulties in processing nonverbal material, just as the reading problems need not be accompanied by math deficiencies. It should be emphasized also that this set of problems is associated with reading disability not just at the outset, but throughout the grade school years (and even beyond). These problems do not necessarily make it impossible for dyslexic children to acquire any reading skill at all but primarily compromise the efficiency and accuracy of word recognition.

2. Comparisons of Specific Reading Disability and Other Reading Problems: Characteristics and Responses to Treatment

The profile sketched above was based on extensive research on children with specific reading disability. There is increasing evidence, however, that this set of problems is at the core of nonspecific reading problems as well. That is, even children whose low achievement is not discrepant from their aptitude, whose learning problems are associated with socioeconomic disadvantage, or whose math achievement is also weaker than that of classmates, exhibit particular weaknesses in metaphonological processing and decoding skills (Juel, 1988; Siegel, 1989; Stanovich, 1984). At present, contrary to traditional assumptions that the nature of the dyslexic's reading problems would differ from that of other reading problems, there is no strong evidence that this pattern of linguistic and reading problems is characteristic only of dyslexia. Instead, there appears to be wide variation among children in their development of phonological awareness and their grasp of the alphabetic principle, quite independent of general intelligence, social group, or disabilities in other areas. This is not to deny, of course, that children with specific reading disability do not differ in other respects from other children who have trouble learning to read. Instead, it might be said that while other poor readers tend to have a broader array of problems with respect to reading itself, their problems are not of a fundamentally different nature.

Because they meet strict criteria regarding discrepancies between achievement and aptitude, children with specific reading disability tend to have higher IQ scores and better achievement in other academic areas than do garden variety poor readers. Consequently, even though the essential nature of the reading problems of all poor readers are apparently the same, it is possible that the same approach to treatment might not be most effective. One of the traditional assumptions about dyslexia is that special remedial instruction is needed for such children. This hypothesis has two bases. First, the causes of specific and nonspecific reading problems may be very different. In particular, the source of difficulty has been hypothesized to be intrinsic, biological, and localized for true dyslexics but not for other poor readers. Even though all poor readers look similar with regard to their phonological and decoding problems, it is nonetheless quite possible that these weaknesses could arise via different etiological paths in different individuals. Second, it has been presumed that a child with greater cognitive capacities, who has used those abilities to achieve at higher levels in mathematics or in areas other than reading, will respond differently to treatment than other children with the same degree of difficulty in reading. Next, a review is given of the research that has been conducted to determine what kinds of interventions are most effective in improving the skills of specific and nonspecific poor readers.

Although the need for specialized treatment of specific reading disability has long been advocated in the field, and although a wide variety of instructional methods have been suggested and implemented during the past half century, surprisingly little research on treatment efficacy has been conducted. Chall (1987), for instance, noted that she "could find no studies specifically directed to finding optimal methods for dyslexic students" (p. 22). Likewise, Gittelman and Feingold (1983) stated that their survey of the literature "failed to identify a single random assignment investigation of reading remediations versus control treatments in children with reading disorders" (p. 167). Only quite recently have any findings become available from better designed treatment evaluation studies using well-defined samples of poor readers.

The characteristic profile of the reading-disabled child indicates that the major obstacle to learning to read is decoding and that the missing ingredient for learning to decode is the ability to perceive and manipulate the phonemic segments of spoken language. From this it might be hypothesized that the most effective focus of remedial efforts, at least for children for whom decoding skills are very weak, would be on making explicit the structural components of spoken language and the links between phonemes and printed spellings. Indeed, there have been several tests of these ideas, and the results, for the most part, have been quite promising. In addition, a few studies have pursued the idea that reading comprehension is hindered by the hypothesized bottleneck in processing that arises when decoding skills are insufficiently automatized or have examined the degree to which text comprehension can be improved by training older dyslexic children on organizational strategies. Because all of these studies are of particular relevance to the question of how best to help adults with reading problems, and because comparable studies are not available for adults, they will be reviewed in some detail.

Gittelman and Feingold (1983) studied 10-year-olds whose initial reading scores were one to two years below grade level. Although described as pure reading disordered, these subjects were generally of lower IQ and lower socioeconomic status than typical dyslexics in other samples, were not much better in math than reading achievement, and were also rather atypical in that they had all been referred to a psychiatric clinic for evaluation of behavioral problems. Nevertheless, it is instructive to examine the results for the two treatment groups--one trained in phonics (decoding) skills ($n = 30$) and one in study skills ($n = 26$). Each subject received 54 individual instructional sessions over an 18-week period. Larger gains were seen for the phonics-trained group on post-tests of decoding, oral reading, and reading comprehension; some differences between the two groups persisted for up to eight months after the end of training. This improvement could not be attributed to any generalized effect of participating in a special program with a sympathetic adult, because the group that received training in study skills was similarly given special treatment, and because the treatment effects were not seen for non-reading-related achievement in math, science, and social studies. As one might expect, although a few months of rather intensive instruction led to improvement, these children still remained far behind their classmates. Nevertheless, the results are very promising in suggesting that working directly on phonological decoding skills can bring about both short-term and long-term gains in reading ability.

Vellutino and Scanlon (1987) compared three kinds of training: whole word and meaning-based word recognition, phonological decoding and segmentation, and a combination of the two approaches. The strongest post-test performance was seen following the combination training, which was effective in improving the skills of both good readers and underachievers, compared to untrained control groups. For the poor readers, improvement in word recognition skill also resulted from phonological training alone. These results thus appear to confirm and extend the findings of Gittelman and Feingold, and suggest that direct, intensive instruction on phonological analysis, decoding, and word-specific learning can be beneficial for children with specific reading disability. However, the training and testing in this experimental study involved pseudowords represented with non-English graphic symbols rather than letters, so it is not clear whether the methods and results are generalizable to the process of learning to recognize real English words.

Segmentation of words into component parts was also recently emphasized in an innovative, computer-controlled training program (Wise et al., 1989; Olson, Wise, Conners & Rack, 1990). In several studies, third to sixth graders with reading disabilities used a mouse to designate unfamiliar words they encountered while reading stories on the computer screen. The computer responded (via a speech synthesizer) by pronouncing the word (e.g., thinking), by pronouncing its syllables separately (think - ing), or by pronouncing subsyllabic units such as the onset and the remainder of a syllable (th - ink - ing). On post-tests of speed and accuracy in reading words and pseudowords, trained groups generally performed better than untrained controls. Mixed results have been obtained to date, however, regarding the relative effectiveness of different segmentation conditions. By demonstrating that dyslexic children are helped not just by immediate feedback as to an unknown word's identity, but even more when the structure of such words is explicitly pointed out, these results are consistent with the two previously mentioned training studies and with the current view that difficulties with metalinguistic analysis are a basic obstacle to word recognition in disabled readers.

Giving children practice in making fine-grained discriminations between spoken words led to considerable improvement in metaphonological skill in a recent study by Hurford (1990). Middle-class second and third graders with average IQs but low reading achievement were assigned to either an untrained control group or a group that was given several hours of practice (over three or four days) on making same/different judgments about stimulus pairs that differed by only one phoneme (e.g., /e/ vs. /ai/, /ri/ vs. /li/, /di/ vs. /gi/). Both groups had similarly poor scores on a pre-test of phonological segmentation skill, compared to a control group of normal readers. When the same measure was readministered after training, substantial gains were observed for the 16 underachievers who had been trained such that they now exceeded the 16 untrained controls; there was no longer any difference on the metaphonological measure between third grade children in the trained condition and normal reading controls. Hurford speculated that in forcing children to notice phonemic differences between syllables, the training procedure helped them to realize what a phoneme is, which in turn allowed them to transfer this insight to a metaphonological task on which they had not been trained.

Lovett et al. (Lovett, 1991; Lovett, Warren-Chaplin, Ransby & Borden, 1990) conducted the most extensive program of research on the effectiveness of various kinds of training programs for improving the reading and spelling skills of dyslexic children. The subjects in these well-designed studies, randomly assigned to treatment or control conditions, were middle-class schoolchildren with severe reading disabilities. The control groups, who received training in general academic strategies, were included to control for treatment time and professional attention. In addition to learning the material that was directly taught, transfer of training was also measured. Some interesting findings were consistent with other training studies already mentioned, while other results were less expected. First, compared to the controls, groups whose training focused directly on word recognition and spelling skills showed sizable gains on post-tests. Second, relatively weak transfer effects were obtained for reading, although spelling of words that were not used as stimuli during training was improved after training. Third, some groups were taught a whole word approach to word recognition and a letter-sequence reproduction approach to spelling, while other groups received training on letter-sound correspondences and the decoding of regular words (with whole-word and letter- sequence practice for irregular words). Unexpectedly, few differences between these two approaches were obtained. Fourth, for no group was there any evidence that the children had extracted any information about letter-sound correspondences; instead, their gains were apparently achieved by acquiring specific lexical knowledge. Hence, the results are positive in demonstrating that the word recognition skills of dyslexic children can be greatly improved by providing plenty of practice with reading and spelling words but are discouraging because these improvements were not attributable to more generalized skill in using sound-letter correspondences to decode unfamiliar words. It is possible, as Lovett noted, that the 35 hours of instruction over a 7-week period provided to her subjects was insufficient to permit the induction of regularities in the relations between letter sequences and speech sounds. Even more likely, given what has been learned about prerequisites to successful reading acquisition from studies of kindergarten and first-grade children, is Lovett's suggestion that her dyslexic subjects may require additional specific training in phonological awareness and subsyllabic segmentation to precede or augment the letter-sound training program (Lovett, 1991, p. 301).

For disabled readers who have achieved some degree of mastery of decoding and word recognition skills, reading comprehension may continue to be impeded by the inefficiency of these processes. The effects of training that emphasize speeded word recognition have been investigated in a recent study of 35 middle to upper-middle class 13-year-old underachievers who were reading at the third- to sixth-grade level (Holt-Ochsner & Manis, 1992). The goal of training was to increase the speed with which the meanings of known words were accessed by having the children play a computerized game in which feedback was given for quickly matching words with their definitions. Different sets of low frequency words, which the children were likely to have in their speaking vocabularies, were used as stimuli during the four training sessions and in tests for transfer of training. As intended, performance on the training games became faster over time, indicating that the treatment did result in increased efficiency in accessing the meanings of the training stimuli. Moreover, these effects transferred to other post-test measures following training. Subjects showed gains in the accuracy and speed with which they could read the training words aloud, understand written sentences containing those words, and match the words with synonyms in a divided attention task. Some smaller gains in speed were seen, furthermore, when stimulus words that had not been used in training were used as stimuli in the post-tests, indicating that the increases in automaticity could be applied more generally. This study provides encouraging evidence that training can be effective in improving the efficiency of word recognition by disabled readers, and can thereby indirectly promote better comprehension.

In a similar study, but with a sample of poor readers from disadvantaged backgrounds rather than children with specific reading disability, Roth and Beck (1987) used speeded computer games to improve the speed and accuracy of word recognition. Following several months of training, greater efficiency in identifying printed words was obtained not only for training materials but also for untrained words, and concomitant improvements on standardized word reading tests and reading comprehension measures were seen.

As noted earlier, once word recognition skills are mastered to about the fourth-grade level, students can switch from learning to read to reading to learn. More advanced readers, therefore, might also benefit from training in

strategies for extracting meaning from connected text. Palincsar and Brown (1984) gave adolescent underachievers several weeks of training, with feedback, on how to organize reading material by formulating questions that would be answered by the most important point in a reading passage. They found that these students showed dramatic improvements in reading comprehension skill compared to control subjects who did not receive this training. Chan (1991) also recently provided similar evidence for the effectiveness of instructing fifth- and sixth-grade underachievers in strategies for text comprehension.

The astute reader will have noted that none of the training studies that have been described actually tested the hypothesis that the effects of training are different for reading-disabled children whose achievement is discrepant from their aptitude than for other children whose low reading achievement is commensurate with aptitude. According to the findings of this study, the only data bearing on that question come from some further analyses by Lovett (Lovett, Benson & Olds, 1990), in which IQ differences among poor readers were examined as a predictor of the effectiveness of the word recognition training programs and one control condition they compared. Interestingly, their analyses revealed that post-test performance was especially improved for children with higher IQs and language skills who received training that emphasized phonological decoding. As in prior analyses, however, even these subjects did not appear to gain any firmer grasp of letter-sound mapping, but rather appeared to use their greater cognitive-linguistic abilities to acquire more word-specific information during training. Moreover, this difference in the effects of training as a function of IQ was so small as to be of little practical applicability. In contrast, by far the most effective predictor of post-test scores was the child's initial level of reading skill.

In sum, training programs of various sorts have been shown to bring about improvements in the reading skills of children with reading disabilities and other poor readers. Such instruction can substantially increase the accuracy and speed of word recognition and the level of reading comprehension, although the amount of training provided in the studies has not been sufficient to eradicate the subjects' decrements in reading skill. Finally, there is no strong evidence to indicate that the effectiveness of instructional programs is much different for different kinds of poor readers.

G0T gegpv'Cf xcpegu'lp'qwt 'Wpf gt ucpf lpi 'qht'j g'Tgcf lpi 'F lkdigf 'Cf wv''

As discussed earlier, traditional assumptions regarding disability included the idea that few problems with literacy persist beyond the school years. This section reviews the evidence pertaining to that assumption, which has proven to be largely false. First, details are given of early arguments, as well as evidence upon which the traditional view was based. Next, more recent research is examined on the persistence of poor reading skills, associated cognitive- linguistic weaknesses, and broader vocational, social, and interpersonal difficulties.

1. Early Views of Reading Disability in Adulthood

The idea that reading problems do not persist into adulthood involved two related suppositions. The first was that the reading problems that may have dominated a child's life in school do not assume the same proportions in adulthood. As expressed by Blalock (1981), there is a "belief that learning disabilities are primarily academic problems and will make little difference once the people are placed in jobs that fit their strengths" (p. 35). For example, whereas schoolchildren are evaluated daily on the basis of their literacy, it would seem that adults can choose callings in which literacy does not play such a central role. In addition, by the time they reach adulthood, dyslexics could have learned to work around or compensate for their reading problems. It could be argued, too, that schools overvalue literacy and the rate at which it is achieved, and once beyond schooling, no one knows or cares just how hard reading once was as long as functional needs are met. Finally, such an assumption incorporates the belief that the reading problems experienced in childhood never expanded beyond that, leaving unaffected one's social and communicative skills or one's ability to do math or engineering.

The second part of traditional assumptions about adult reading disability is that the underlying condition endures, taking on other, more subtle forms. It was suggested that the problems "dissipate over time and are

hardly detectable in later life; that only spelling difficulties persist; [and] that strategies are developed to cope with limitations so that residual difficulties are hidden" (Temple, 1988, p. 190). In short, what was once a reading problem is evident only in atrocious spelling and a slower reading rate, but comprehension is fine, given sufficient time. This belief is reflected in the policies of testing services and universities of allowing diagnosed dyslexics to take standardized aptitude tests and nonstandardized classroom examinations in an untimed format.

These ideas derived in large part from follow-up studies of persons who experienced reading problems as children and were interviewed in adulthood. Several studies, most notably those by Rawson (1968); Rogan and Hartman (1976, 1990); Silver and Hagin (1985); and Finucci, Gottfredson, and Childs (1985); have served to establish that intelligent children with a documented history of specific reading disability can--with appropriate schooling, a supportive home environment, and substantial financial resources achieve an overall successful adjustment to adult life, whether that is measured in terms of vocational, emotional, or educational status. For example, in Rawson's (1968) study of 56 dyslexic boys, 100% completed college and many went on to become lawyers, scientists, professors, and high-level business executives. And yet, consistent with the picture outlined above, more than half of these college-educated adults reported problems with reading rate and spelling; very few reported significant problems with reading skill per se (Rawson, 1968). Similar results were reported by Finucci et al. (1985) who followed up 500 graduates of the Gow school for dyslexic boys; over 50% had earned a bachelor's degree and the majority were employed in high level positions, lending further support to the view that long-term effects of dyslexia may be ameliorated within the context of high socioeconomic status, intensive educational intervention, and high intelligence.

The limitations of generalizing from this body of research are obvious. First, the samples that have been studied have not been representative of the larger population of disabled readers. Instead, they have exemplified mainly an elite subgroup whose reading difficulties were identified and treated at young ages in an era during which this was not commonplace. Also, these subjects were often blessed with high intelligence and were from relatively affluent families. Many had attended private schools that could provide specialized instruction, typically with a strong phonics orientation, in conjunction with a solid vocational and emotional support system. As acknowledged by the researchers, all of these circumstances may have contributed to the successful adult outcomes observed in these samples. Furthermore, virtually all of the subjects included in the studies discussed above were educated prior to P.L. 94-142, and thus it is not known how many of them would have met contemporary diagnostic criteria for reading disability. And finally, outcome data were based on subjective interview data, not on objective testing, making it difficult to compare profiles in childhood and adulthood, or to establish a solid overall picture of current academic function.

What an adult reports as a lack of a problem may nonetheless show up as a significant weakness in a more formal assessment of literacy skills.

2. Methodological Considerations

Recent methodological advances have both expanded and sharpened the picture of the learning-disabled adult. In particular, three changes inform this study.

First, enough time has passed since P.L. 94-142 was enacted that the first wave of school-identified reading-disabled children has now reached adulthood. As a consequence, the number of studies following reading-disabled children into adulthood has increased dramatically, with greater assurance of continuity of measures and broader representativeness. Although many studies continue to rely on self-reports, the results can be interpreted with greater confidence if they are consistent with those derived using a prospective design. The best of these studies have data available from both childhood and adulthood.

Second, more sophisticated approaches have been taken to assess adult outcomes, especially with regard to those areas of function most often implicated in reading-disabled children. Rather than just asking adults whether they still experience difficulties in reading, or relying on a single reading measure, many studies now

provide us with in-depth profiles of current cognitive function (Blalock, 1981; Temple, 1988). Much of the progress that has been made in understanding adult reading disability has taken place within the context of behavior genetics studies, for which it is important that diagnostic measures for specific reading disability be valid and reliable for family members of all ages. As discussed earlier, in studies of children, the ideal profile includes normal intelligence, reading levels 1.5 to 2 standard deviations below the IQ standard score, and, perhaps, IQ-appropriate mathematics achievement. A number of studies now indicate that these criteria can successfully be applied to adults as well, with a high correspondence between diagnoses made on adult measures and those based on either self-report and/or childhood history (Felton, Naylor, & Wood, 1990; Finucci, Whitehouse, Isaacs, & Childs, 1984; Finucci et al., 1986; Naylor, Felton, & Wood, 1990; Pennington, Van Orden, Smith, Green & Haith, 1990; Scarborough, 1984).

Third, having established the validity of adult measures for well-defined cases of specific reading disability, researchers have begun to undertake more careful studies of nonspecific reading disabilities as well. For reasons presented above in our discussion of the same definitional concerns in children, there are many reasons to expect commonalities across these two groups, with regard to a core deficit and patterns of abilities and response to treatment. Paralleling the growing trend in the schools, the term learning disability is typically applied broadly to include anyone whose intelligence is in the normal range (with a cutoff as low as 85 on full-scale measures and as low as 70 on subscales) and whose reading is not age-appropriate, whether or not there is an IQ-achievement discrepancy (refer to Horn, O'Donnell & Vitulano, 1983, for a review). Consistent with this broader definition, studies of adult learning disabilities often include samples that are quite different from those in studies of pure dyslexia. In learning-disabled adults, poor reading is typically accompanied by low-normal IQ, lower to lower-middle socioeconomic status, and associated deficits in math achievement, with math deficits occasionally even exceeding the reading deficit (Buchanon & Wolf, 1986). Because the term learning disability could conceivably be applied to any poor reader who is not retarded, many studies include adults referred through vocational agencies, without positive identification of a discrepancy at all.

Despite the obvious demographic differences that distinguish those subjects recruited for genetics studies and those referred through vocational agencies, it must be acknowledged that an adult reading disability that looks to be nonspecific may have been more circumscribed at an earlier point. One reason may be the operation of potential Matthew effects; the lack of exposure to written material may have a deleterious effect on IQ, causing the disparity to narrow over time. Similarly, because progress in math so often depends upon reading and may be hampered by the other negative consequences of reading problems, a once specific problem can begin to broaden. Finally, children raised in a middle-class environment can easily fall into a lower social class bracket if they fail to complete high school. In the review to follow, care has been taken to define each sample with regard to IQ, social class, and math functioning so as to aid the reader in working out this particular dilemma. Each of the points to be made focuses first on cases of specific reading disability, as was done with children, and then expands to nonspecific learning-disabled groups, suggesting they may have much in common with those who were earlier referred to as garden variety poor readers, becoming less and less distinguishable from the other adults seeking literacy instruction.

3. Academic Achievement Levels in Reading-Disabled Adults

With regard to academic outcomes, attention is given to two major conclusions that have been consistently found across all varieties of studies of adults with reading disabilities, whether or not they meet the criteria for specific reading disability: (1) childhood reading disability persists into adulthood; and (2) the pattern and components of reading implicated in reading disability are similar to those observed in children with reading disability.

Both individual case studies and large-scale studies free from bias have confirmed the persistence of reading disability into adulthood. As has been noted in several reviews on the topic, there is no study which has not found some persistent reading and spelling deficiencies in adults who had been identified as reading disabled in their school years (Bruck, 1985; Felton et al., 1990; Finucci et al., 1985; Gerber & Reiff, 1992; Horn et al.,

1983; Miles, 1986; Naylor et al., 1990; White, 1992; White, Alley, Deshler, Shumaker, Warner, & Clark, 1982). Persistence has been found in both the most narrowly defined cases of specific reading disability and in the most broadly defined cases of nonspecific learning disability, whether the subjects were school or clinic identified, whether or not remediation has been provided, and whether outcome measures were based on interview or standardized test data.

Sometimes, particularly in advantaged samples, the signs of persistence have been subtle, as was found in the early interview studies already mentioned. For example, Pennington et al., (1986) and Finucci, Guthrie, Childs, Abbey & Childs (1976) found that only spelling was notably deficient in adults with a history of reading disability. Gerber, Ginsberg and Reiff (1992) have also corroborated these early findings. With the cooperation of national societies for disabled learners, they located 46 self-referred adults who were characterized as highly successful; more than half these adults had doctoral degrees and all earned from \$3000 to over \$100,000 annually. Nevertheless, these adults with reading disabilities talked about their need to use compensatory strategies, such as learned creativity, to get around their persisting problems with reading and writing. Their strategies included using tape recorders and dictaphones, using word processors with spell-checkers, and most especially, relying on support staff. One particularly creative subject used pictures to help remember facts about a client; another claims to have taught himself lip-reading to help him visualize words during conversations.

More often, however, the persisting deficits are very deep and broad, indicating that literacy skills are rarely mastered at a high level by individuals with reading disabilities (Miles, 1986; Miller, 1988; White, 1992). One of the most dramatic demonstrations of the persistence of reading disabilities was a study of 40 clinic-identified dyslexic boys, diagnosed at age 10 and followed up at ages 20 and 28 (Frauenheim 1978; Frauenheim & Heckerl, 1983). This study addressed many of the methodological concerns discussed earlier by testing and interviewing adults using the same measures used to make the diagnosis in childhood. The boys initially met regression-based criteria, presenting poor reading and spelling mean grades (1.9 and 1.4) despite low- normal IQ means (verbal, 84; performance, 94), minor difficulties with math (mean grade level, 3.1), middle-class backgrounds and no obvious neurological impairment. All of the subjects had experienced academic difficulties from the onset of schooling and all received special (and often intensive) reading help from specially trained persons. By age 20, 80% of the subjects had completed high school, but reading and spelling had increased only to the second- to fourth-grade level.

Similar findings were obtained in a follow-up study of school-identified nonspecific poor readers in semi-rural Virginia who had less severe initial diagnoses and a somewhat higher mean IQ of 99 (DeBettencourt, Zigmond & Thornton, 1989). At age 11.5 years, these children were a year or more behind in reading achievement, and they continued to show decrements of similar magnitude compared to non-gifted, non-handicapped peers when followed up ten years later. Other follow-up studies, discussed in greater detail below, have obtained similar evidence for clear persistence into adulthood of reading problems identified in childhood (Bruck, 1985, 1990; McCall, Evahn, & Kratzer, 1992; Felton et al., 1990).

There is now considerable evidence that reading problems not only persist, but continue to involve the same aspects of reading that pose the greatest obstacle to learning to read in childhood. Contrary to the common belief that most adults can sound out words effectively but have higher level problems with comprehending what they read, recent evidence suggests that comprehension problems are often accompanied by decoding problems as well. Furthermore, the persistence of word recognition and especially phonological decoding problems is seen both in adults with pure reading disability and in those with more general learning problems or lack of educational opportunity. For example, in a profile of self-referred young adults with nonspecific learning disabilities, Blalock (1981) describes a subset of 18 subjects who obtained grade level scores of 4.8 to 15 on the word recognition subtest of the Wide Range Achievement Test. And yet, when presented with a simple phonics test, not one subject could provide the correct sounds for all the consonants, and most failed to finish the task. She noted that although these individuals complained of reading speed problems, "evaluation revealed that the actual problem was in poor (non-automatic) decoding. Their efforts to decode, then re-read for meaning, made reading a laborious time-consuming task" (p. 40).

Similar findings were obtained by Read and Ruyter (1985), whose subjects were male prison inmates scoring at or below the fifth-grade level on a standardized reading comprehension measure. Normal intelligence was confirmed by scores within one standard deviation on the Wechsler nonverbal subtest (equivalent to a standard score of 85 or above). Although their word recognition scores were equivalent to those of normal fifth-grade readers, their performance on two decoding tasks (pseudowords and real words following regular orthographic rules) lagged well behind, so as to be comparable to reading-disabled fifth graders. Consistent with this split, when compared to normal third and fourth graders, the subjects scored higher on exception words, equivalent on regularly spelled words, and lower on pseudowords. Both results suggest that subjects were using word-specific associations rather than sound-spelling rules to read and spell regular words. The correlations between the various decoding measures were nonetheless high (82% to 89%), indicating that better decoding was associated with a larger word recognition vocabulary, just as has been found in comparable studies with children. Severe deficits in pseudoword decoding were also obtained in adults attending Adult Basic Education or Literacy Volunteer classes (Pratt & Brady, 1988); in that sample, poor readers could read an average of less than four pseudowords, compared to an average of 42.7 read correctly by a control sample matched in nonverbal IQ, age and social class.

The subjects in the above studies were selected because they were currently experiencing problems in reading; it might not be surprising, therefore, that word recognition and decoding problems were an important part of their profile. More impressive still are a number of studies in which adults were identified on the basis of a childhood diagnosis of reading disability, independent of current function (Bruck, 1990; Felton et al., 1990), or on the basis of genetic risk combined with a tested discrepancy between intelligence and reading (Gross-Glennm Jallad, Novoa, Helgren-Lempesis & Lubs, 1990; Kitz & Tarver, 1989; Pennington et al., 1990; Scarborough, 1984). In these studies, word recognition and decoding skills were found to be weak, even in those subjects who claimed they did not experience reading problems. These adults consistently did poorly at reading isolated words, reading pseudowords, and reading aloud connected text in which content words are replaced by pseudowords, thereby preventing the reader from relying on contextual clues.

Additional evidence for the persistence of word recognition problems derives from a study involving 37 adults (aged 20- 44.6 years) with well-documented childhood dyslexia, having been evaluated by June Orton between 1957 and 1972 (Felton, et al., 1990). The original diagnoses had been made on the basis of normal intelligence (mean, 102; performance, 105; verbal, 98) and below-average reading scores, calculated by using quotients comparing reading to IQ (.67 on oral reading fluency; .74 on word recognition). This study had two control groups: a normal reading group (n = 16) who had been seen as children at the same clinic and who had reading quotients of .90 or above on both measures, and a borderline group (n = 34) from the same sample who did not fit neatly into either group. When assessed as adults on cognitive and reading measures, the reading-disabled group attained normal levels of performance on arithmetic (they had been a year below grade level in the childhood assessment), but continued to perform significantly below the other two groups on both oral reading fluency and word recognition. Word recognition was especially affected. Whereas 33% of the group identified as reading disabled in childhood scored within normal limits on the oral reading of paragraphs (the Gray Oral Reading Test), only 14% scored within normal limits on the reading of single words (the Wide Range Achievement Test-Revised). On the other hand, many of the 37 had improved their reading skills considerably; 27% scored in the borderline range and another 24% in the average range. Of the borderline readers, 76% were normal readers in adulthood by Finucci's criteria, and only one fell into the impaired range (Naylor et al., 1990). Even after controlling for differences in intelligence and social class, pseudoword reading measures in adulthood served as an accurate indicator of childhood reading status.

Perhaps the most compelling evidence that word recognition remains unmastered by these adults comes from a study by Bruck (1990). She selected adults on the basis of a childhood diagnosis of reading disability, with a bias toward positive outcomes (as only those of the original sample who were currently enrolled in college were included). Childhood diagnoses had been made on the basis of an average IQ (minimum, 85; mean, 107) and a reading level at least 1.5 years below grade level (mean lag in oral reading, 2.3; word recognition, 1.6). At follow-up, their receptive vocabulary standard scores were quite variable (mean, 97; range, 67-113) as were

scores on a nonverbal measure (mean, 104; range, 80- 123). They achieved near-normal scores on a standardized reading comprehension test (41st mean percentile, 11.5 grade equivalent), but performed less well on word recognition (32nd mean percentile, tenth grade equivalent) and spelling (20th mean percentile, seventh grade equivalent).

All scores for the sample were significantly lower than those of a control group of college students matched in age, education, and sex, but were comparable to those of a control group of sixth grade good readers, selected for having performed above the 60th percentile on the same measures. The dyslexic students made more errors in reading both real words and pseudowords than age-matched controls, but they also made twice as many errors on the pseudowords as the sixth graders, despite nearly equivalent word recognition and somewhat superior reading comprehension levels. The dyslexic sample also showed delayed response time for both words and pseudowords compared to both control groups, and differed more from control subjects on nonword than on word latencies, consistent with their extreme difficulty with pseudowords. Of the three samples, only the dyslexic subjects took longer to recognize high frequency exception words than regular words, although their response time was extremely slow in both conditions. At the very least, this suggests that automaticity in word recognition has not been achieved for any class of words. This same explanation might account for the fact that dyslexic college students were behind the sixth graders in accuracy of reading one-syllable words, but that the two groups were hampered to the same degree by multisyllabic words; perhaps the sixth graders had achieved automaticity for one-syllable but not for multisyllable words, whereas the college students had achieved automaticity for neither. Consistent with non-automatic processing, the dyslexic subjects were reliably slower than controls in all conditions.

In several of the studies already discussed, it has become evident that it is not just accuracy, but also the automaticity and speed of word recognition that discriminates adults with and without reading disabilities. As pointed out by Gross-Glenn et al., (1990), however, there seems to be a speed-accuracy tradeoff. Subjects may slow down and read accurately or speed up and make errors. This phenomenon seems consistent across the many studies already discussed, whether the population is pure or even compensated dyslexic adults or whether the group is comprised of lower-functioning adults with nonspecific learning disabilities. The phenomenon is evident whether in single word serial naming of both real and pseudowords (Gross-Glenn et al., 1990; Bruck, 1990) or reading paragraphs (Gross-Glenn et al., 1990; Miles, 1986; Scarborough, 1984). Decker (1989) also reported speed of recognition of pronounceable pseudowords to be one of the best predictors of reading disability in adults. Blalock (1981) reported that the foremost problem with her 38 self-referred adults was automaticity, and many were better at isolated skills than at actual reading (i.e., so slow and non-automatic that they could not attain comprehension). In short, in virtually every group of reading-disabled adults that has been studied, there is some evidence of deficiencies in accuracy, automaticity, or speed of word recognition skills, whether these adults are currently reading at the first-grade level or at the eleventh-grade level. This phenomenon appears to be independent of absolute IQ, at least for samples with IQs above 85.

Whereas studies of reading-disabled adults consistently show deficiencies in word recognition measures, reading comprehension performance is more variable. Earlier, a description was given about how reading comprehension in children depends jointly on word recognition and listening comprehension; further, it is suggested that the same two components influence reading comprehension in adults as well (Sticht, et al., 1974; Sticht & James, 1984). Even if listening comprehension abilities are intact, the persisting inefficiency of word recognition is likely to create a bottleneck in processing that would impede extraction of meaning, as is seen for unskilled reading in childhood. Indeed, many adults also have difficulties with reading comprehension despite apparently good verbal intelligence.

On the other hand, one might expect adults to have had much more practice in trying to overcome their reading difficulties and to have developed more sophisticated strategies for circumventing them. There is evidence that some disabled adult readers, more so than unskilled children, can use contextual cues very effectively to improve comprehension. For example, Blalock (1981) observed that her sample was amazingly adept at using contextual cues, such that they could read many words in context that they could not decode in isolation (on the

basis of spelling sound correspondences alone). More systematic studies have supported Blalock's observation that comprehension levels may exceed isolated word recognition skill. For example, Pennington et al., (1990) found such a pattern in two different groups of dyslexics, each with a self-reported history of reading and spelling difficulty plus a current significant discrepancy between aptitude and reading level. One group was identified through the family study; the other was recruited from a reading clinic at the local community college. When compared to eighth-grade schoolchildren matched on word recognition, dyslexic subjects were significantly behind on pseudoword reading and spelling but ahead on reading comprehension, performing almost at the grade level of chronological age controls (dyslexics, 11.0; age-matched controls, 12.8; reading level controls, 10.5). In this sample, it seems there were many dyslexics whose reading comprehension skills were within the normal range, despite deficient decoding skills.

A similar pattern was also observed by Bruck (1990), using the sample described earlier; despite childhood histories of dyslexia and persistent decoding deficits, her subjects had managed to achieve eleventh-grade reading comprehension scores and were progressing through college. How did they comprehend as well as they did? In a systematic comparison of words read in isolation and in meaningful context, Bruck found that context aided the dyslexics in both accuracy and speed; the error rate of the dyslexics dropped from 9% to 2% and reaction time dropped by 136 milliseconds. In contrast, the sixth grade reading-level controls did not show any contextual facilitation (they apparently did not fully appreciate the content of the passage), and the facilitation shown by normal adult readers was very small though significant (22.6 milliseconds). It should be pointed out, however, that even when reading words in context, the reaction times for the dyslexic group were significantly slower than the times obtained for sixth graders reading the words in isolation (681 vs. 598 milliseconds). In her attempts to understand processes of reading comprehension, Bruck further divided her group of college dyslexics into good comprehenders (>50th percentile, n = 7) and poor comprehenders (<25th percentile, n = 8). The two groups did not differ significantly on word recognition (accuracy, speed, or error pattern), spelling, or nonverbal intelligence. Rather, only listening comprehension (assessed through verbal intelligence measures) discriminated good and poor comprehenders. These findings are consistent with the view that reading comprehension depends crucially on listening comprehension and that listening comprehension may operate independently of word recognition, as outlined in the reading comprehension model presented earlier (Sticht, 1974; Hoover & Gough, 1990).

Also consistent with this model is the possibility of adults whose decoding skills are intact but whose reading comprehension is limited by poor listening comprehension skills. Although this pattern has not been found in pure form among reading-disabled individuals, work by Sticht suggests that such individuals exist. For example, using parallel measures for listening and reading comprehension, Sticht (1972) found that poor readers among 100 army recruits had listening comprehension skills equivalent to reading comprehension level. From this he concluded that poor readers are also poor language understanders. There are two ways to interpret these findings in light of the data on reading-disabled adults. It could be argued that the army recruits would not qualify as reading disabled exactly because reading is not significantly below general intelligence (which correlates highly with listening comprehension). Alternatively, it may be that these recruits would have shown decoding deficits as well if measures of automaticity and speed had been employed. Although it may turn out that the association between listening comprehension may be a crucially important distinction between the reading-disabled adult and the one who is functionally illiterate, our suspicion is that the only way to accurately identify (and treat) the sources of reading difficulty is to test both to see whether listening comprehension is at a high level and whether decoding skills are accurate and automatic. On the one hand, the very fact that intelligence exceeds reading comprehension in the reading-disabled sample suggests that these subjects are still in the early stages of acquisition prior to achieving what Sticht refers to as mature reading, typically achieved in seventh or eighth grade, and that decoding skills have not been mastered. On the other hand, it cannot be denied that language comprehension plays an important and separate role in reading comprehension and that training in oral listening and in content areas will serve to improve reading comprehension (Sticht et al., 1974).

Finally, the traditional notion that only spelling remains unimpaired in reading-disabled individuals can be understood in relation to recent research on adults. That is, spelling requires very similar skills to those needed

for word recognition: for regular words, a grasp of letter-sound correspondences; for irregular words, familiarity with memorized word-specific letter sequences. In view of this, it is not surprising that many researchers have confirmed that poor adult readers indeed are also typically poor spellers (Aaron & Scott, 1986; Blalock, 1981; Bruck, 1990; Bruck & Waters, 1990; Miles, 1986; Pennington et al., 1990; Scarborough, 1984). For many disabled readers, their spelling difficulties are simply more tangible and self-evident, perhaps leading to the misapprehension that only spelling remains a problem.

4. The Cognitive Linguistic Profile of the Reading-Disabled Adult

The evidence discussed thus far suggests that those aspects of reading which proved most difficult for reading-disabled children also constitute obstacles to skilled reading in adulthood. But one might hypothesize that the underlying causes of reading difficulty may have ameliorated over the years. The focus is on the three areas most commonly implicated in childhood reading disability: phoneme awareness, speed and accuracy of lexical access, and verbal memory. As will be seen, whereas phoneme awareness and lexical access are fully implicated in adulthood, the story regarding phonological memory is more complicated.

In adults, as in children, phoneme awareness measures are strong predictors of phonological recoding skill and word recognition knowledge. This is true both for nonspecific learning-disabled adults (Pratt & Brady, 1988; Read & Ruyter, 1985) and for adults in family studies who, on the basis of measures on standardized tests, appear to have compensated for the reading problems (Pennington et al., 1990). In every sample of reading-disabled adults that has been tested for it, phoneme awareness problems have been apparent (Blalock, 1981; Byrne & Ledez, 1983; Liberman, Rubin, Duques & Carlisle, 1985; Perin, 1983). These deficits are upheld when comparisons are made with normal reading controls matched on age, social class and nonverbal IQ (Pratt & Brady, 1988), matched on (or co-varying for) verbal IQ (Felton et al., 1990), or when the dyslexic adults were compared to developing children of equivalent reading status (Read & Ruyter, 1985). Phoneme awareness problems are evident in adults with reading disabilities, but not in adults who have pure math disabilities or who are not affected (Siegel, 1992). Although limited access to orthographic strategies might plausibly explain the poor performance of subjects on some phoneme tasks such as speaking in pig Latin, segmenting spoken words into phonemes, or deleting phonemes from words, evidence for more global phonological deficits suggests that the problem is deeper than that. For example, syllable counting generally develops prior to reading instruction and is a good kindergarten predictor of later reading success (Liberman et al., 1974; Mann & Liberman, 1984); however, Blalock (1981) noted that only 11 out of 36 learning disabled could count the syllables in words ranging from 2 to 5 syllables. Blalock also noted that 16 of 26 subjects had problems with rhyming tasks, and the subject in Temple's (1988) case study could not reliably distinguish rhyming from non-rhyming words (e.g., load/cold), and was limited in his ability to produce rhymes. In short, deficits in phonological sensitivity appear to be robust and potentially even causal.

Reading-disabled adults also show a reliable decrement in speed when compared to normal reading controls (Decker, 1989; Felton et al., 1990; Miles, 1986; Wolff, Michel & Ovrut, 1990). Decker (1989), for example, found that when IQ was controlled for, only the measures of speed of lexical access (naming letters) and speed of pseudoword decoding distinguished dyslexic adults from normal reading adults; the groups did not differ on spatial or mathematical measures. Felton et al., (1990) obtained similar results; within a large battery of measures, only rapid naming proved as important as pseudoword reading and phonological awareness as indicators of a childhood history of reading disability, once differences in intelligence and social class status had been controlled for. Other evidence for impoverished performance on a rapid naming task was found by Wolff et al., (1990) in a study of 90 middle-class adolescents and adults with specific developmental dyslexia. When compared to other learning disabled controls without reading problems, but matched for age, sex, social class, and normal IQ, the dyslexics made more errors and had slower speeds in producing labels for colors and pictures of common objects. These data suggest that naming speed acts as a rate-limiting factor on reading fluency in adolescents and adults.

In a particularly interesting demonstration of problems with speed, Miles (1986) compared college students with reading disabilities with other normal-reading college students in their response to 28 days of practice in identifying briefly displayed sets of digits, letters, and Russian letters. With practice, the normal readers improved dramatically over the month (from 700 milliseconds to less than 10), but only moderate reductions were attained by the dyslexic students (from 1500 to 525 milliseconds). The poorer readers also pointed more slowly to orally or visually labeled parts of a video figure (hand, mouth, eye, etc.) and were much slower at verifying statements such as "the star is to the left of the cross" in response to visual arrays of symbols.

The full story on lexical access, however, is not yet clear. Pennington et al., (1990), for example, used a discrete trial lexical naming task and found that although dyslexic adults were slower than age-matched control subjects, they were no slower than children of equivalent reading ability. Furthermore, even in studies that have found differences between reading-level matched groups, speeded naming scores have not usually been correlated in any systematic way with individual differences in reading skills. Clearly, there is a need for further work on this issue.

The third area of phonological processing implicated in childhood reading disability and in anecdotal reports of adult poor readers is verbal short-term memory (Brady, 1991). Verbal memory refers to the identification, retention, and recall of verbally encodable stimuli, whether orally or visually presented; there is considerable evidence that this store is phonological at base. As in the body of research on childhood reading problems, systematic experiments on adults have yielded more variable results than have been obtained for phoneme awareness. For instance, Pennington et al., (1990) found that clinic-referred dyslexics, but not familial pure dyslexics (from a sample studied from a behavior genetics vantage point), had shorter digit spans than nondisabled adult readers. Interestingly, there seems to be a trend toward greater weaknesses in verbal memory among adults with nonspecific reading problems (i.e., with accompanying math deficits and/or low IQ) than among adults with specific reading disability. For example, Siegel (1992) found that adults with specific reading disability (with normal math skills and normal IQ) and those with specific math disabilities (with normal reading skills and normal IQ) did not have verbal memory deficits; whereas adults with low achievement in both math and reading (and with somewhat lower average IQs) did show weaknesses in memory skill. Likewise, Read and Ruyter (1985), whose sample was functioning in the low-normal IQ range, found that memory deficits were related to weaknesses in decoding and phoneme awareness. Similarly, learning-disabled adults who were referred through vocational rehabilitation agencies and who presented broad and severe academic problems were described as having specific deficits in verbal (but not nonverbal) memory (Minskoff, Hawks, Steidle, & Hoffman, 1989; McCue, Shelley, & Goldstein, 1986).

Other cognitive-linguistic deficiencies associated with developmental dyslexia have sometimes, but not consistently, been observed to characterize adults with reading disability. With regard to the perception of spoken words, Blalock (1981) reported that 12 of her subjects had particular difficulty in identifying words presented against a background of noise; but Pennington et al., (1990) failed to find such a deficit in either his familial or clinical sample. There is also some evidence of the persistence of some linguistic and metalinguistic weaknesses beyond the phonological level in disabled adult readers. Poor syntactic skills (Duques, 1989), grammaticality judgments (Blalock, 1981; Kean, 1984), and morpheme awareness (Liberman et al., 1985; Rubin, Patterson, & Kantor, 1991) have all been observed in adult samples of poor readers. This area has not received sufficient attention, however, for firm conclusions to be drawn.

In sum, the profile of the reading-disabled adult looks remarkably similar to the profile of the reading-disabled child with regard to the cognitive-linguistic deficits that tend to accompany poor achievement in reading. Phoneme awareness and rapid lexical naming are consistently found to be weak in both nonspecific and specific cases of reading disability, and the severity of the reading problem is associated with the severity of these associated problems. Verbal short-term memory weaknesses, however, appear to be more prevalent among nonspecific cases of reading disability. Finally, reading disability may or may not be accompanied by general verbal comprehension deficits, but this appears to be more directly related to reading comprehension than to word recognition.

5. Adaptive Functioning in Reading-Disabled Adults: A More Heterogeneous Profile

Although studies of academic and cognitive-linguistic abilities have revealed many commonalities between reading-disabled adults and reading-disabled children, other areas of functioning do not necessarily show such parallels. Adulthood itself introduces many new circumstances having to do with educational, vocational, social, and personal adjustment. If individuals with reading disabilities have difficulty meeting these new challenges, they may come to resemble less the traditional image of the successful adult dyslexic and more the traditional image of the illiterate adult. As will be reviewed, however, there is considerable variability among and between samples of poor readers with regard to the success with which they deal with the choices and demands of everyday life.

First, beyond the school years, academic achievement is not among the typical adult's central concerns, such that individual reading problems may be disregarded or underestimated in many cases. In fact, several studies have found that adults rank reading problems below other, more pressing, needs. For example, according to a survey of 562 learning-disabled adults belonging to the Association for Children with Learning Disabilities (Chelser, 1982), the most frequently mentioned need item was social skill training; a need to overcome dependence was also frequently cited. Help with reading and spelling, on the other hand, was not viewed as often as a primary concern. Similarly, other samples of adults with reading problems have been described as most concerned with "daily living skills" (Blalock, 1981) or as having "a lack of adequate social and personal relationships" (Gerber & Reiff, 1992, p. 5).

Recent research has shown that, some notable successes notwithstanding, most adults with reading disabilities do indeed experience a wide range of difficulties in coping with daily life. Compared to normally-reading peers of the same age and social background, they are less likely to complete high school, have more difficulty obtaining and retaining jobs, and tend not to marry, such that many end up living with and remaining dependent on their parents, with their social lives confined to the family circle (DeBettencourt et al., 1989; Gerber & Reiff, 1992; Malcolm et al., 1990; McCall et al., 1992; McCue et al., 1986; Minskoff et al., 1989).

Although it is generally the case that a childhood reading disability places adults at risk for a broad range of problems in social, emotional, and vocational functioning, there is nevertheless considerable heterogeneity of outcome. As pointed out by Horn et al., (1983), at one extreme are samples like Rawson's in which 100% completed college, and at the other extreme are samples like Frauenheim & Heckert's (1978), in which 92% were still reading below the fifth-grade level. Why such heterogeneity exists has been of considerable interest to many investigators and reference to the reader is made to some thorough and interesting recent reviews of this issue (e.g., Gerber & Reiff, 1992; Horn et al., 1983; White, 1992).

Drawing firm conclusions about the determinants of successful and unsuccessful outcomes is hindered somewhat by several aspects of the research pertaining to this issue. First, in different studies, outcome evaluations have been conducted at different ages during adulthood. A younger adult not only has had less time to find his or her niche but also faces a rather different economic situation than an older adult. Second, comparing follow-up studies to adult-identified samples could be problematic, because the latter are selected for study precisely because they are experiencing difficulties. Third, interpreting negative outcomes-- particularly regarding social-emotional functioning--is hampered in some cases by the lack of appropriate comparison samples of equivalent social class, education, and so forth, so that it is not clear to what extent such problems can be attributed to the reading disability itself. Fourth, when outcome assessments are based on interviews with the affected individuals (or other informants, such as parents), the accuracy of the information obtained can be questioned.

Despite these drawbacks, the research converges in identifying several important factors affecting the educational, vocational, personal, and social development of individuals with reading problems. In general, more successful outcomes have been found to be associated with a variety of factors including IQ in childhood,

greater access to appropriate intervention, higher levels of educational attainment, more supportive home environments, and greater financial resources. As summarized by Gerber and Reiff (1992), "the profile that emerges of the successful adult with learning disabilities reflects a moderate to mild impairment, a relatively affluent family background, and a positive educational experience" (p. 12). A similar conclusion was reached by Horn et al., (1983), who report that adult outcome is affected by age at diagnosis, initial severity, IQ, and social class. Indeed it seems that those with the most successful outcomes had advantages on all of these counts (Rawson, 1968), while problems in any one of these areas could lead to a negative outcome.

One way to interpret these findings is to note that all of these factors are strongly associated with socio-cultural status. Several investigators have been led to just that conclusion (e.g., Gottesman, 1975). Horn et al., (1983) noted that of ten studies of middle-class children, 50% reported a favorable outcome; of four studies of working-class children or those of lower social class, 100% had unfavorable outcomes. It certainly seems that the combination of a reading disability and low social class is particularly deleterious. Although socioeconomic status obviously contributes to these various factors, it does not tell the whole story, as there is considerable variability within as well as between social class groups.

A more potent, though not wholly unrelated, factor is the initial severity of the deficit, which incorporates not only the actual level of reading, but also aptitude (Horn et al., 1983) and the generalizability of the deficit to areas other than reading (Frauenheim & Heckerl, 1978; Siegel, 1992). For example, in the Rawson study, where social class differences had been controlled for, there was a high correlation ($r = .68$) between reported adult reading outcome and severity of childhood diagnosis. A study of a quite different sample found that it was not socioeconomic status, aptitude measures, or disparity between aptitude and achievement, but rather high school grades (perhaps the best measure of the absolute severity of the deficit) that predicted outcome thirteen years later (McCall et al., 1992).

Siegel (1992) has suggested that absolute severity of the reading deficit, generalizability to other academic domains, and general aptitude measures may be confounded. She compared adults with pure reading, pure math, and combined reading and math deficits. Although IQ scores were comparable in the pure reading and pure math samples, the combined deficit groups had lower IQ and more generalized cognitive deficits. At the same time, reading was even more impaired in the combined disability than in the pure disability. What does seem clear from these studies is that disparity is not the marker of prognosis, but rather absolute function in reading; this is entirely consistent with the findings from childhood treatment studies discussed above. Horn et al., (1983) came to the same conclusion in their review, pointing out that the more severe outcomes were those referred to childhood clinics; those derived from school records alone were probably less severe to begin with, hence explaining the more favorable outcomes. In sum, the best predictor of reading success in adulthood is absolute severity of function in childhood. This single measure is in turn affected by socioeconomic status, initial IQ and instructional opportunity and is reflected in such measures as the specificity of the deficit, a clinic versus school diagnosis, and age of diagnosis.

Two very recent studies have moved beyond those external factors, which are largely outside the control of the subjects themselves, to look at personality factors that discriminate between greater or lesser success when socioeconomic status, intelligence, and severity are held constant. To "ascertain patterns of successful functioning that promote high levels of vocational success," Gerber, Ginsberg, & Reiff (1992) conducted in-depth interviews of highly successful adults ($n = 46$) and moderately successful adults ($n = 25$) with learning disabilities; these groups were matched in age, parental socioeconomic status, and severity of reading disability in childhood and adulthood. What they reported is consistent with studies of higher achievers in other populations without learning disabilities: high success individuals were characterized by a belief in an internal locus of control and were goal driven, persistent, accepting of their disability, and adaptive to it with a variety of compensatory strategies. McCall et al., (1992) reached a similar conclusion in their comparisons of high school underachievers and generally poor achievers. Although absolute level of performance was the single most important predictor of outcome, poor grades may in turn reflect locus of control factors. They suggested that

underachievers had consistently experienced failure and had developed tendencies to give up in the face of challenge or adversity.

In sum, research on adult outcomes of reading disability suggests that although the disability itself persists in adulthood, there is considerable variability in the severity of the ultimate deficit and its impact on overall functioning. Adult outcomes are not so much a function of the size of the IQ-achievement disparity, but rather of overall level of function (especially childhood verbal IQ), associated areas of dysfunction (whether or not math was also impaired), instruction (good instruction certainly does not seem to guarantee success; its absence seems to ensure failure), socioeconomic factors (a learning disability and low socioeconomic status is a particularly negative combination) and positive coping style. Across all studies, the most significant determinant of later success, however it is defined, is absolute level of performance in childhood; the less severe the problem, the better the prognosis, independent of IQ and socioeconomic status.

HO Rqde{ 'Kó r nec vkppu<F ghlplpi . 'F lci pqu lpi . 'cpf 'Vt gc vlpi 'vj g' Cf wv'Y kj 'Tgcf lpi 'F Hllewnlgu''

A rising concern in the literacy community, and the impetus for this paper, is the recognition that many of the adults arriving for literacy classes are there not just because of prior lack of motivation or educational opportunity, but because of a reading disability that may impede further progress and/or require special instruction (Gottesman, 1992). Two related questions are of central concern: (1) Should adults with a reading disability be distinguished from other poor readers who present themselves at literacy programs? (2) Can these groups be distinguished? The argument can be made that reading disability research has much to offer regarding two other important questions as to whether a distinction should be made between adults who are disabled and those who are not: (1) How should one assess the instructional needs of the low-literate adult? (2) What instructional methods should be brought to bear? What needs-- including assessment and treatment--are shared by the reading-disabled adult and others without a reading disability?

1. Should Reading-Disabled Adults Be Distinguished From Other Poor Readers?

The first question is one that is both practical and, arguably, a matter of individual preference. That is, independent of possible theoretical distinctions between adults (or children) who are reading disabled and those who are not, what might be gained by invoking such a distinction? Three reasons can be given for choosing to distinguish reading-disabled adults from other struggling readers. First, and most important, once this distinction is made, reading-disabled adults will have different instructional needs, and consequently, their response to standard instruction will be less favorable. Anecdotal reports from literacy instructors suggest that certain adults are far less responsive to instruction than others. The question they have raised is whether these intractable cases are in fact reading disabled (or learning disabled) and hence beyond the kind of help that literacy instructors can provide without special training. To date, there is no evidence to confirm or to refute that those adults who fail to respond are, in fact, reading disabled. This, then, remains an open question.

Furthermore, there is no reason to believe at this point that adults with reading disabilities and other adults of equally limited reading ability should respond differently to different kinds of instruction. Indeed, the evidence from above suggests that it is absolute reading level, and not how discrepant this level is from aptitude, that most strongly determines an individual's prognosis.

A second reason to consider making a distinction between those persons with a reading disability and others enrolled in literacy classes is the potential benefits that may be provided to handicapped individuals. This would have relevance, for instance, to individuals who wish to qualify for untimed testing (this is most relevant to college students) or for hiring and training of the handicapped. Guidelines and mechanisms for handling these situations have already been established in many places. For the more usual situation faced by providers of adult literacy services, however, this concern may not be a central one.

A third reason to make a diagnosis of reading disability is the potential for positive psychological outcomes. This can work in two ways. On the one hand, many adults report feeling relieved to know the source of their difficulties and consequently can move forward to cope with them. For example, although moderately and highly successful adults differed widely in their decision regarding whether to let others know about their disability, Gerber et al., (1992) did find that an acceptance of the disability was an important step to achieving high success. Similarly Bogdan (1982, cited in McGill-Franzen, 1987) found that high school students who had been classified as learning disabled benefited socially and were better off than when they were considered simply stupid. On the other hand, a label for many individuals could create a barrier for just those adults who are working hardest to gain entrance to mainstream society.

As noted by Lieberman (1987):

[Many] handicapped individuals are able to fade into the adult world and lead satisfactory and even fulfilled lives. They would abhor the idea of someone coming along even suggesting that they were handicapped in some way. Their worst memories in life may be that being handicapped was thrust upon them in school. (p. 64).

Lieberman also made the point that learning disabilities may become a hook on which to blame every reason for not maximizing one's potential. This is consistent with earlier accounts of children in which it was argued that the only difference that could be found between Chapter 1 children (disadvantaged) and learning-disabled children was one of expectations; the Chapter 1 children were expected to catch up to their peers, while the learning-disabled child was expected to have this disability for life. There is no clear answer from this perspective. Lieberman said, "Learning disabilities in adults are meaningful only if it helps people live....Some people who are LD should be LD adults. It will help them live. Others who are LD, should stay a million miles away from it" (p. 64).

In short, the clearest reasons to distinguish reading-disabled adults from other poor readers would be if it would aid (and not hinder) psychological well-being, if differential instruction would be called for, or if it would allow the individual to gain access to some special privileges or considerations that would prove helpful and that would otherwise be denied.

2. Can Reading-Disabled Adults Be Distinguished From Other Adults Seeking Literacy Instruction?

Among adults presenting themselves for literacy instruction, some have true reading disabilities and some do not. That is, some adults' difficulties undoubtedly stem solely from a lack of prior opportunity or effort, whereas others' problems with learning to read were probably genetic in origin and unrelated to their general cognitive aptitude, access to instruction, and social background. The existence of etiologically distinct types of reading problems in the adult population, however, does not mean that operational criteria can necessarily be specified to distinguish reliably between them. In this section, the impact of the research reviewed above is examined as reasons to reject several plausible bases for making such distinctions.

To begin with, it is important to note that some pure instances of specific reading disability can be, and have been, identified by applying to adults the diagnostic criteria that conventionally have been used in research with children. When an adult poor reader fits this traditional stereotype (high aptitude, normal math achievement, mainstream social and educational background, absence of sensory deficits, and so forth), then a positive identification can be made. In the larger number of cases in which only some or none of the criteria for reading disability are met, however, one can neither confirm nor rule out the existence of an intrinsic reading disability. Specifically, research suggests that the status of the majority of adults cannot be resolved by applying any of the most obvious approaches that follow.

First, the reading-disabled adult cannot be distinguished from the low-literate adult on the basis of demographic factors. Many attested cases of reading disability are in the lower social strata. Indeed, because factors associated with socioeconomic status tend to lead to a negative prognosis for children with reading disability, one is even more likely to see lower social class than higher social class persons in adult literacy classes or in

other agencies dealing with literacy issues. Second, prior educational classifications are not reliable for making the distinction. As discussed earlier, many schoolchildren who are classified as learning disabled are not done so based upon established criteria; conversely, children who do meet the criteria often go unidentified by the schools. Third, true reading disability cannot be distinguished from low achievement on the basis of motivational differences. Even if low motivation did not lead to underachievement in the first place, low achievement will often have reduced one's motivation well before adulthood (the so-called Matthew effects).

Fourth, even actual reading scores do not solve all diagnostic problems. Absolute reading level alone is not a clear indicator because the reading level of the illiterate/low-literate adult and the reading-disabled adult may well be in a similar range. Although some reading-disabled adults remain wholly illiterate, it seems more common for them to achieve at the fifth-grade level or better, and in some of the studies reviewed above, adults with reading disabilities were reading at an eleventh-grade level on standardized measures of reading comprehension. There are also problems with regression-based or discrepancy-based equations, which are often used in adult studies. Because there remains a high correlation between aptitude and reading skill in adulthood, some true cases of reading disability that continue to show discrepancies can be identified. However, IQ testing must be conducted by professional psychologists, is time-consuming and expensive, and is controversial--especially with regard to minority populations. Furthermore, in several of the follow-up studies reviewed, verbal IQ slipped slightly, but definitely, from childhood to adulthood, consistent with the Matthew effects hypothesis. Persons who would have qualified in childhood would probably not qualify in adulthood, depending on ultimate reading levels. Thus, even where regression measures were taken, and one could be confident about the reliability of the positive classifications deriving from them, one could still potentially misdiagnose many adults as not having a reading disability.

Fifth, a distinction between reading disability and low-literacy cannot easily be made on the basis of the reading or cognitive profile. As reviewed, reading profiles are tied more to absolute level of reading skill than to the disparity between aptitude and IQ. This is demonstrably the case in children, for whom differences in profile do not distinguish the garden-variety poor reader from the reading-disabled child, and there are many reasons to believe it should be so for comparably defined groups of adults. For example, the reading/cognitive profiles of low-literate prisoners and adult education students were not demonstrably different, except in terms of breadth, than the cognitive profiles of carefully selected samples with specific reading disability based on family resemblance.

In light of the difficulties inherent in identifying the source of adult reading problems, it is interesting to observe that many studies ostensibly focusing on learning disabilities have moved away from a concern with this distinction to focus instead on identifying the specific attributes and needs of adults presenting themselves for instruction. For example, in many of the studies reviewed in Section V, the term learning disabled was applied to any group of adults whose intelligence was average (or low-average) and whose reading levels fell below some cutoff, generally at the grade-school level. Although this certainly meets the discrepancy criterion currently applied in most school districts, it leaves aside questions pertaining to the source of the difficulties. The overarching learning disability label is considered justified on the basis of the similarity in profiles between these groups and other groups where validation has been achieved.

Because the great majority of adults seeking literacy instruction today present limited reading skills concomitant with a more generalized learning problem and/or the motivational and educational disadvantages of a lower socioeconomic status, the multiple factors associated with literacy problems are nearly impossible to disentangle. Based on careful study of these nonspecific learning-disabled adults, this particular combination of factors merits considerable concern. Affected individuals stand to benefit greatly from systematic skills-based reading instruction, but the overall prognosis of persons with a general learning disability is particularly bleak, whether this be defined in terms of educational attainment, employment status, or emotional well-being. To suggest that this group does not have special needs due to an unknown source of its current level of function is to deny reality. In sum, unless there is a pressing need to positively identify a person with a specific reading

disability (for the reasons suggested in section F.1), there is little to be gained by attempting to make the distinction in most instances.

3. Choice of Diagnostic Instruments

Independent of whether the literacy community considers distinguishing between adult poor readers who do and do not meet criteria for reading disability, there is an urgent need for a more systematic approach to diagnosing reading problems in adults who present themselves for treatment. There are several, often conflicting, goals for the ideal diagnostic instrument. A first goal is to establish the severity of the reading problem for placement purposes. A second, and related, goal is to provide the instructor with sufficient information to plan treatment that builds on existing competencies and focuses on areas of greatest need. Also related is the need to evaluate progress, both for individual charting of growth and for purposes of program evaluation. These goals are in direct conflict with other needs that must be taken into account in designing a diagnostic instrument. First, as can be verified by anyone who has administered tests to adult poor readers, efforts to preserve dignity are in order. For example, asking adults to read passages aloud may prove more embarrassing than asking them to read passages silently and answer questions. A measure should also allow the examiner to zero in on the locus of the client's difficulties while ensuring more success than failure. Second, the current focus on functional literacy has led to an expressed concern that diagnostic instruments have face validity, such that clients should be asked to read the actual materials (e.g., newspaper ads, driver manuals) with which they may be encountering difficulty, rather than seemingly irrelevant lists of isolated words. Finally, practical concerns dictate that diagnostic measures be both efficient (complete in a single visit) and relatively easy to score (instructors should not need to be professional diagnosticians).

Two kinds of diagnostic tools are currently in wide use in adult literacy programs, though neither was designed to detect reading disability, *per se*. (For reviews, see Kirsch & Guthrie, 1977-78; Sticht, 1988; Venezky, 1992; Venezky, Bristow, & Sabatini, *in press*). One kind are tests of basic skills, such as the comprehension section of the Test of Adult Basic Skills or the Stanford Diagnostic Reading Tests. These measures provide some index of overall function, potentially useful for initial placement of individuals and for monitoring the effectiveness of programs. They are easy to administer and, because they can be administered in groups (except for non-readers), they are efficient. They have face validity inasmuch as the actual materials being read are of interest/relevance to the reader. Finally, because they do not require reading aloud, dignity is preserved.

The other measure currently in wide use are tests of functional abilities, including those used in the National Adult Literacy Survey (NALS) and the Young Adult Literacy Survey (YALS). These tests require adults to give short answers in regard to everyday reading materials such as bus schedules or newspaper advertisements and assess numerical abilities as well as reading skill. This type of measure has two main virtues: efficiency and face validity. It has been used in population testing to provide new estimates of adult literacy levels.

Although both kinds of measures provide some initial assessment of overall reading status, and hence the severity of the problem, neither is sufficient to plan for treatment. As discussed earlier, performance on standardized comprehension measures depends upon two kinds of abilities: word recognition and listening comprehension. A single score, such as the eighth-grade level, could be achieved via the combination of high intelligence and very limited word recognition skills, via average intelligence combined with well-developed decoding skills that have not yet become automatic and so overly stress verbal memory, or via well developed word recognition skills combined with limited understanding of the content of the passage. The problem may be further exacerbated by the equation of an adult comprehension score with norms developed on children. As Venezky (1992) suggests, "a sixth grader who reads at a sixth-grade level and an adult who reads at a sixth-grade level usually have widely different reading abilities and require different forms of instruction, yet by grade level measures they are classed as identical" (p. 3). It should also be noted that of all standardized reading measures, those assessing reading comprehension have proven to be most problematic, in large part because of the tremendous influence of background knowledge on reading comprehension. On the other hand, tests of functional abilities are even more subject to confounding problems. In their present form, these measures

incorporate word recognition, general comprehension, experience with the particular materials, and even mathematical and problem-solving ability. Venezky notes that the major functional reading test correlates less with standardized measures of reading comprehension ($< .70$) than it does with standardized measures of mathematics. In short, while these tests are very useful for providing a population index of overall literacy, performance on them reflects so many skills that it is impossible to plan treatment wisely on the basis of such a score.

Researchers have generally relied on more analytic diagnostic instruments than those currently used by clinicians. They typically focus less on establishing a person's overall reading level and more on establishing a profile of strengths and weaknesses in component skills to aid in determining why an individual is at a particular level. In assessing reading, therefore, researchers typically distinguish between measures of word recognition, decoding, comprehension of connected text, oral reading fluency and oral language facility (e.g., listening comprehension). When no standardized instruments are available, furthermore, the researcher can develop experimental measures (e.g., for assessing decoding automaticity, or for examining the effects of topic familiarity on comprehension). While such a complicated fractionation of skill assessment is both inefficient and unwarranted for achieving the clinician's goals, the careful delineation of component skill profiles has been useful in gaining an understanding of reading problems from the research, and some of these contributions can be carried over into the practical sphere.

An ideal diagnostic measure battery for adults seeking literacy instruction should provide information about five aspects of functioning, although some of these skills can be inferred from other measures. First, as in current practice, a test of reading comprehension should continue to be used to determine the overall reading level. Overall proficiency is most related to adaptive function and incorporates performance on all other skills. Many tests suitable for this purpose are available. As noted earlier, however, comprehension scores can be strongly influenced by a person's familiarity with the topic discussed in the text, so the appropriateness of a test's content should be taken into account in selecting a measure of reading comprehension.

Second, a diagnostic measure of reading should include a measure of listening comprehension (or verbal aptitude) to identify any problems with spoken language that may be impeding the adult's current reading performance and that may have to be worked on to facilitate improvement in reading. Verbal facility has several components, but these tend to be highly correlated with each other such that assessing any single aspect can provide a rough index of overall proficiency in spoken language. For example, listening comprehension can be measured by obtaining spoken responses to orally presented materials that are similar to the written passages on corresponding reading comprehension tests (e.g., as on the Durrell scales or the Woodcock-Johnson Psychoeducational Battery). Alternatively, measures of single word vocabulary knowledge (e.g., Peabody Picture Vocabulary Test) or selected verbal subtests from verbal intelligence tests (e.g., Wechsler Adult Intelligence Scales) could be used for this purpose. As noted above, regarding reading comprehension measures, it is important to select language tests that have content appropriate to clients' backgrounds.

Third, a word recognition measure in which clients must read aloud words presented in isolation is essential to any sensitive diagnosis of reading problems in adults. Research on diverse samples of adults who have varied widely in overall reading levels indicates very clearly that it cannot be assumed that word recognition skills are fully developed in any reader whose reading comprehension is deficient. Used in comparison to reading comprehension scores, a word recognition measure provides an important clue as to how much emphasis should be placed on lower-level and higher-level processing in instruction. This recommendation to grant a more prominent role in the diagnostic process to assessing word recognition gains further support from a study by Venezky, Bristow, and Sabatini (cited in Venezky, 1992). They found that a locator vocabulary screen functioned just as well as, if not better than, a full three-hour test battery in making placement decisions for adult students in Adult Basic Education or GED classes. Ideally, a measure of pseudoword decoding would accompany the word recognition measure, since this provides the clearest evidence regarding the reader's grasp of the correspondences between letters and sounds, a skill that importantly underlies the entire reading process. Although there are presumably several tests that meet these needs, one available pair of measures that is

commonly used in research on both children and adults are the Word Identification (real words) and Word Attack (pseudowords) subtests of the Woodcock-Johnson Psychoeducational Battery (mentioned above). These measures are well normed for adults and are quick to administer. In addition, for adults whose decoding skills are neither fully mastered nor wholly lacking, a supplementary diagnostic assessment (e.g., using the stimuli from Part II of the Decoding Skills Test) can provide more detailed information as to which sound-letter regularities have and have not been mastered.

Fourth, when good word recognition/decoding and good listening comprehension are seen in conjunction with poor reading comprehension,[2] the examiner should pursue the possibility that decoding automaticity is lacking, creating a bottleneck that impedes comprehension. To this end, it is important for the examiner to note, during the administration of the real word and pseudoword recognition tests, how slowly or haltingly the adult makes his or her responses. If an automaticity problem is indicated, then a normed test of reading speed/efficiency, such as the Gray Oral Reading Test, can be given. Because this test requires extensive reading aloud by the client, which may be unsettling, its use is only recommended when there is reason to suspect an automaticity problem.

Fifth, an interview with the client is obviously an essential component of treatment planning. The interview should provide information regarding the person's educational history, perceptions of which aspects of reading are causing difficulty, and broader vocational or personal goals for which help is being sought. The interview should also seek to determine whether the person's reading problems might be associated with visual or hearing difficulties or with a prior incidence of head injury or disease. Last, if mathematics proficiency is also to be included in the treatment objectives, then it, too, should be assessed directly, using a test that focuses on numerical calculation rather than on solving verbally presented problems (in which poor reading can interfere with performance).

This set of measures would provide sufficient information to guide decisions regarding initial placement and instructional needs and could also be used to evaluate the progress of an individual or program over time. The proposed measures are moderately dignity-preserving inasmuch as a minimum of oral reading is required and most recommended tests are designed to be discontinued once the examinee has made a certain number of errors; further preservation of dignity would be at the expense of sacrificing important information. The set of measures is also reasonably efficient, insofar as few of the tests are overly long, and scoring is generally quite straightforward. In contrast, the widely used TABE battery requires nearly three hours of testing (Venezky, 1992), which is far more than is needed for the assessment procedure that has been recommended. The criterion of face validity, however, is not as clearly met by the proposed battery. Fortunately, it is clear from research, and from personal experience, that adults are willing to suspend face validity when working with a sympathetic tester. In administering pseudoword measures, for example, often one can stress just how strange the task is, but that it nevertheless helps to understand how a person figures out words. It is encouraging to read, in a review of self-perceived needs of learning-disabled adults, that 62% expressed a willingness to be tested, even though they felt that they already understood their problems.

In sum, a picture of an adult's overall level of reading proficiency, a profile of his or her strengths and weaknesses in different component processes (understanding spoken and written material, recognizing printed words, decoding based on letter-sound regularities, and processing of text in a fast and efficient manner), and information about the client's educational history and current objectives can be derived from the set of measures proposed. Novice readers would be expected to show poor word recognition accuracy and low overall achievement levels; if their listening comprehension skills are relatively strong, a primary instructional emphasis on decoding and practice in word recognition would be called for, whereas if listening comprehension is also weak, then instruction aimed at revealing regularities in both spoken and written language would be needed. Nonautomatic readers would be expected to show moderate accuracy but slow speed of word recognition, indicating a need for practice (especially speeded practice) in the reading of both isolated words and connected text. Weak comprehenders would have difficulties in fully extracting meaning from both written and oral language, regardless of the speed and accuracy of their lower-level reading skills. For these individuals,

instruction could also focus on strategies and methods for improving comprehension. Finally, independent of an individual's overall reading level and socioeconomic or educational background, pure cases of specific reading disability could be identified on the basis of far better proficiency in listening comprehension than in reading skills, but a distinction between specific reading- disabled adults and other poor adult readers cannot readily be made for those who do not show this clear-cut profile.

4. Instructional Methods

The adult who seeks help for a reading problem typically has many strengths: self-awareness that a problem exists, motivation to improve, an appreciation of the need for better literacy skills, considerable world experience, and so forth. It is possible, too, that linguistic skills essential to reading will have undergone considerable development since childhood. In these respects, the adult is better prepared to learn and can be a more satisfying student to teach than a child with similar reading problems. On the other hand, many adults' needs are greater and more immediate than the child's, so the challenge to the instructor can be more formidable. It is beyond the scope of this paper to discuss how instructors should go about maintaining motivation, providing personal counseling, and establishing a warm and supportive working relationship with adult clients. Instead, the immediate concern is with what the available research may indicate about the treatment of the client's reading skills themselves.

As reviewed earlier, research on the remediation of children's reading problems suggests that both for pure dyslexics and for garden variety poor readers, both low-level and high-level literacy skills can be improved through intensive skill-focused treatment procedures. Helping children with minimal reading skills to become more consciously aware of the structural elements of spoken language can lead them to acquire greater phonological awareness; and providing them with extensive practice in identifying printed words can improve word recognition skills. Beyond the novice level, there is some evidence that engaging in speeded word recognition tasks can lead to increased automaticity and improved comprehension. Also, instruction and practice in metacognitive organizational and study skills, such as self-monitoring of comprehension, can improve the ability to extract meaning from text, which is the ultimate goal of skilled reading.

Well-controlled studies of treatment programs for adults are notably lacking. However, several investigators have applied to adult populations the principles that have proven most successful with young children first learning to read. In particular, consistent with the observed lack of phonological awareness among adult poor readers, they have included explicit instruction on the analytic structure of words, together with instruction in letter-sound correspondences. These investigators have written up descriptive accounts of their procedures and the underlying rationale and are uniformly enthusiastic regarding the success they have achieved using a language analysis approach (Lewkowitz, 1987; Liberman, Shankweiler, Blachman, Camp & Werfelman, 1980; Bell & Lindamood, 1992). Given the evidence of adult deficits in this area, the positive effects of phoneme awareness training in childhood, and the clinical reports regarding adult successes, it is recommended that phoneme awareness instruction be included as an important piece of training for any adult with diagnosed decoding problems.

It should be pointed out, however, that the possible limits, if any, are not known yet on the degree of improvement that can be achieved by applying to adults the variety of methods that have been successful with children. Most intervention programs with children have lasted only a few months, and, despite notable gains in skill, the experimental subjects have almost always remained behind their peers in reading abilities at the conclusion of training. Nevertheless, the work that has been conducted with children is quite promising in suggesting that skill-focused training can bring about improvements in skill. Given the similarity between low achieving adults and children with regard to the range and nature of their reading problems, there is reason to be optimistic that such interventions would be effective for adults who seek help in reading.

On the technical side, the use of computers as instructional aids shows great promise for adults as well as children. Computers equipped with voice synthesizers can supply immediate assistance with word recognition

and may also be programmed to point out how letters and sounds within words can be broken up into component segments. Computers can also be programmed to measure and give feedback on the speed of processing; they are probably the best means of increasing automaticity. Those equipped with libraries of stored knowledge bases can provide, at the student's request, vocabulary information and even written and illustrated background information about topic domains that pertain to reading passages. Furthermore, this information can be tailored to the particular type of reading that the client encounters on the job; for instance, the word recognition stimuli and background facts that the student practices on can be customized for workers in a particular industry (e.g., banking, insurance, construction, etc.), as is now starting to be done in some adult literacy programs sponsored by private companies. Computer-assisted training in reading can also be fun (when practice is incorporated into game formats), and a computer is infinitely patient and can give more immediate and consistent feedback than a typical human instructor. Finally, using computers to assist in skills training frees the human instructor to concentrate on the broader motivational, vocational, and personal goals of the client. For all of these reasons, despite the initial expense of obtaining and programming computers, the gains of moving in this direction will potentially outweigh the costs.

The analysis on instruction ends with two points. First, research on the relative effectiveness of various approaches to treating adults' reading problems is sorely needed. At present, knowledge relies upon the understanding that has been gained about the nature of reading deficiencies in adults who seek help, about the similarities between reading difficulties of adults and children, and about the relatively few good investigations of treatment efficacy for children. Given that adults and children differ in other respects such as motivation and job-orientation, it is likely that the way skills are taught could be modified to capitalize on those strengths.

Second, the available research implies that the greatest emphasis in instruction will still have to be placed on identifying and improving the specific component skills that prevent these adults from being skilled readers. This is not only a function of the fact that adult poor readers often turn out to be more deficient in these skills than had previously been appreciated, but also of the fact that the most solid research progress has been made in understanding and treating these deficits.

I OUwo o ct{'t'pf 'Eqpenwukpu'

We began this review by taking a fresh look at the traditional distinction between reading disabled and illiterate/low-literate adults. The argument has been made that while the distinction may still be valuable for theoretical purposes, it may not be as clear-cut or useful as it once was for most practical situations. The practical reality is that a large number of adults seeking literacy instruction today present limited reading skills concomitant with a more generalized learning problem and/or the motivational and educational disadvantages of a history of failure and a lower socioeconomic status. Within this group, it is nearly impossible to disentangle the multiple problems contributing to and stemming from the reading difficulty. At the same time, the research suggests that if a person remains a poor reader in adulthood (as a great many children with reading problems do), then it matters little whether the reading problem stemmed initially from a localized intrinsic limitation, from a general learning problem, or from inadequate educational opportunity. Instead, some highly advantaged individuals notwithstanding, most adult poor readers are likely to have a great deal in common with regard to their overall literacy levels, their profiles of component reading skills, their difficulties with phoneme awareness and other associated cognitive-linguistic weaknesses, their educational and vocational histories, their social-emotional difficulties, their expressed needs and, potentially, their responsiveness to literacy assistance/training in adulthood.

Moreover, it is striking that their reading abilities appear to be hindered by weaknesses in the same components of the reading process that have been shown to pose the greatest challenges to children learning--and especially failing to learn--to read: sufficient mastery of letter-sound regularities to accomplish efficient word recognition, an adequate understanding of spoken language and general knowledge to discover the meanings conveyed by connected text, once decoding has been achieved. Consequently, it has been argued that to plan effective

instructional programs for adults seeking literacy assistance, it is essential to use a sensitive diagnostic battery that will be informative about which aspects of the reading process are most problematic for an individual. This study has suggested that the most effective approach to adult reading instruction would be a skill-based one that is tailored to the client's current levels of skill in word recognition, decoding automaticity, reading comprehension, and listening comprehension. It has further been suggested that many adults with persisting deficits in decoding will also be aided by instruction in oral phonological analysis skills as well as in print-focused training.

Finally, although some, but not nearly all, pure cases of specific reading disability (or dyslexia) can probably be diagnosed using the procedures outlined, there are few compelling reasons for attempting to make such distinctions in practice. In other words, the severity and nature of an individual's reading problem should be the guiding factor in providing treatment, and the term disability should be applied only where some practical advantage is to be gained. Just as it is unrealistic to pretend that the reading problems of all low-literate adults stem solely from low motivation and poor prior instruction, so, too, would it be a disservice to adults to assume that a failure to read is indicative of a constitutional and insurmountable deficit.

Endnotes

[1] Although learning disability and reading disability are often used interchangeably, in the present paper the focus is restricted to reading disability (or dyslexia), which makes up the largest proportion of learning disability diagnoses. Although much of the research to be discussed has focussed on reading disability in the absence of other learning problems, there are many reasons to believe that the conclusions drawn apply to reading problems that are comorbid with these other conditions. What is not addressed in this paper are learning disabilities that do not specifically include a reading component, such as specific math disability or attention deficit disorders.

[2] In a very small number of individuals, a problem called visual discomfort may lead to a similar pattern of performance. These adults may show marked improvement in reading comprehension when the reading material is rearranged (e.g., less compactly) on the printed page.

References

Aaron, I. E., Chall, J. S., Durkin, D., Goodman, K., & Strickland, D. S. (1990). The past, present, and future of literacy education: Comments from a panel of distinguished educators, Part I. *The Reading Teacher*, 43(4), 302-311.

Aaron, P. G., & Scott, P. (1986). A decade of research with dyslexic college students: A summary of findings. *Annals of Dyslexia*, 36, 44-66.

Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Adams, M. J., & Huggins, A. (1985). The growth of children's sight vocabulary: A quick test with educational and theoretical implications. *Reading Research Quarterly*, 20, 262-281.

Allington, R. L. (1983). The reading instruction provided readers of differing reading abilities. *The Elementary School Journal*, 83, 548-559.

Annett, M., & Manning, M. (1990). Reading and a balanced polymorphism for laterality and ability. *Journal of Child Psychology and Psychiatry*, 31, 511-529.

- Ball, E. W., & Blachman, B. A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly*, 26, 49-66.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge: Cambridge University Press.
- Bell, B., & Lindamood, P. (1992). Issues in phonological awareness assessment. *Annals of Dyslexia*, 42, 242-59.
- Benton, A. (1978). Some conclusions about dyslexia. In A. L. Benton & D. Pearl (Eds.), *Dyslexia: An Appraisal of Current Knowledge* (pp. 451-476). New York: Oxford University Press.
- Bishop, D., & Butterworth, G. (1980). Verbal-performance discrepancies: Relationship to both risk and specific reading retardation. *Cortex*, 16, 375-389.
- Blachman, B. (1984). Relationship of naming ability and language analysis skills to kindergarten and first-grade reading achievement. *Journal of Educational Psychology*, 76, 610-622.
- Blalock, J. W. (1981). Persistent problems and concerns of young adults with learning disabilities. In W. M. Cruickshank & A. A. Silver (Eds.), *Bridges to tomorrow: The best of ACDL* (pp. 35-55). Syracuse, NY: Syracuse University Press.
- Bowey, J., & Francis, J. (1991). Phonological analysis as a function of age and exposure to reading instruction. *Applied Psycholinguistics*, 12, 91-121.
- Bradley, L., & Bryant, P. (1978). Deficits in auditory organisation as a possible cause of reading backwardness. *Nature*, 271, 746-747.
- Bradley, L., & Bryant, P. (1983). Categorizing sounds and learning to read - a causal connection. *Nature*, 301, 419-421.
- Brady, S. A. (1991). The role of working memory in reading disability. In S. Brady & D. Shankweiler (Eds.), *Phonological processes in literacy* (pp. 129-151). Hillsdale, NJ: Lawrence Erlbaum.
- Baker, L. & Brown, A. L. (1984). Metacognitive skills in reading. In P. D. Pearson (Ed.), *Handbook of reading research*. New York: Longman.
- Bruck, M. (1985). The adult functioning of children with specific learning disabilities. In I. Sigel (Ed.), *Advances in applied developmental psychology* (pp. 91-120). Norwood, NJ: Ablex.
- Bruck, M. (1990). Word recognition skills of adults with childhood diagnoses of dyslexia. *Developmental Psychology*, 26, 439-454.
- Bruck, M., & Waters, G. (1990). An analysis of the component reading and spelling skills of good readers-good spellers, good readers-poor spellers, and poor readers-poor spellers. In T. Carr & B. A. Levy (Eds.), *Reading and its development: Component skills approaches* (pp. 161-206). New York: Academic Press.
- Buchanon, M., & Wolf, J. S. (1986). A comprehensive study of learning disabled adults. *Journal of Learning Disabilities*, 19, 34-38.
- Bulkeley, W. M. (1992). *Computers ease some illiterates' days on the job*. New York: B1, B5.

- Butler, S. R., Marsh, H. W., Sheppard, M. J., & Sheppard, J. L. (1985). Seven-year longitudinal study of the early prediction of reading achievement. *Journal of Educational Psychology*, 77, 349-361.
- Byrne, B. (1992). Studies in the acquisition procedure for reading: Rationale, hypotheses and data. In P. B. Gough, L. C. Ehri, & R. Treiman (Eds.), *Reading Acquisition* (pp. 1-34). Hillsdale, NJ: Erlbaum.
- Byrne, B., & Ledez, J. (1983). Phonological awareness in reading-disabled adults. *Australian Journal of Psychology*, 35(2), 185-197.
- Carr, T., & Pollatsek, A. (1985). Recognizing printed words: A look at current models. In D. Besner, T. G. Waller, & G. E. MacKinnon (Eds.), *Reading research: Advances in theory and practice* (pp. 1-82). Orlando, FL: Academic Press.
- Chall, J., Heron, E., & Hilferty, A. (1987). Adult literacy: New and enduring problems. *Phi Delta Kappan*, 69(3), 190-196.
- Chall, J. S. (1987). The importance of instruction in reading methods for all teachers. In *Intimacy with language: A forgotten basic in teacher education* (pp. 15-32). Baltimore, MD: Orton Dyslexia Society.
- Chan, L. K. S. (1991). Promoting strategy generalization through self-instructional training in students with reading disabilities. *Journal of Learning Disabilities*, 24, 427-433.
- Chelser, B. (1982). ACLD committee survey of LD adults. *ACLD Newsbrief*, 145(1), 5.
- Collette, M. A. (1979). Dyslexia and classic pathognomic signs. *Perceptual and Motor Skills*, 48, 1055-1062.
- Crain, S., & Shankweiler, D. (1988). Syntactic complexity and reading acquisition. In A. Davison & G. Green (Eds.), *Linguistic complexity and text comprehension: Readability issues reconsidered* (pp. 167-192). Hillsdale, NJ: Lawrence Erlbaum.
- Crowder, R. G., & Wagner, R. K. (1992). *The psychology of reading* (2nd ed.). New York: Oxford University Press.
- Curtis, M. (1980). Development of components of reading skill. *Journal of Educational Psychology*, 72, 656-669.
- DeBettencourt, L., Zigmond, N., & Thornton, H. (1989). Follow-up of postsecondary-aged rural learning disabled graduates and dropouts. *Exceptional Children*, 56, 40-49.
- Decker, S. (1989). Cognitive processing rates among disabled and normal reading young adults: A nine year follow-up study. *Reading and Writing: An Interdisciplinary Journal*, 2, 123- 134.
- Denckla, M. B., & Rudel, R. G. (1976). Rapid automatized names (R.A.N.): Dyslexia differentiated from other learning disabilities. *Neuropsychologia*, 14, 471-479.
- Duques, S. (1989). Grammatical deficiencies in writing: An investigation of learning disabled college students. *Reading and Writing: An Interdisciplinary Journal*, 2, 1-17.
- Ehri, L. C. (1992). Reconceptualizing the development of sight word reading and its relationship to decoding. In P. B. Gough, L. C. Ehri, & R. Treiman (Eds.), *Reading Acquisition* (pp. 107-143). Hillsdale, NJ: Erlbaum.

- Ellis, A. W. (1985). The cognitive neuropsychology of developmental (and acquired) dyslexia: A critical survey. *Cognitive Neuropsychology*, 2, 169-205.
- Felton, R. H., Naylor, C. E., & Wood, F. B. (1990). Neuropsychological profile of adult dyslexics. *Brain and Language*, 39, 485-497.
- Fielding, L., Wilson, P., & Anderson, R. C. (1986). A new focus on free reading: The role of trade books in reading instruction. In T. Raphael & R. Reynolds (Eds.), *Contexts of literacy* (pp. 149-160). New York: Longman.
- Fingeret, A. (1984). *Adult literacy education: current and future directions*. Columbus, OH: ERIC Clearinghouse on Adult Career and Vocational Education.
- Finucci, J. M., Guthrie, J. T., Childs, A. L., Abbey, H., & Childs, B. (1976). The genetics of specific reading disability. *Annals of Human Genetics*, 40, 1-23.
- Finucci, J. M., Gottfredson, L. S., & Childs, B. (1985). A follow-up study of dyslexic boys. *Annals of Dyslexia*, 35, 117-136.
- Finucci, J. M., Whitehouse, C. C., Isaacs, S. D., & Childs, B. (1984). Derivation and validation of a quantitative definition of specific reading disability for adults. *Developmental Medicine and Child Neurology*, 26, 143-153.
- Fowler, A. E. (1988). Grammaticality judgments and reading skill in grade 2. *Annals of Dyslexia*, 38, 73-94.
- Fowler, A. E. (1990). Factors contributing to performance on phonological awareness tasks. *Haskins Laboratories Status Reports*, 108/109, 1-17.
- Fowler, A. E. (1991). How early phonological development might set the stage for phoneme awareness. In S. A. Brady & D. P. Shankweiler (Eds.), *Phonological processes in literacy* (pp. 97-117). Hillsdale, NJ: Erlbaum.
- Frankenberger, W., & Fronzaglio, K. (1991). A review of states' criteria and procedures for identifying children with learning disabilities. *Journal of Learning Disabilities*, 24, 495-506.
- Frauenheim, J. G. (1978). Academic achievement characteristics of adult males who were diagnosed as dyslexic in childhood. *Journal of Learning Disabilities*, 11, 476-483.
- Frauenheim, J. G., & Heckerl, J. R. (1983). A longitudinal study of psychological and achievement test performance in severe dyslexic adults. *Journal of Learning Disabilities*, 16, 339-347.
- Frith, U. (1980). Unexpected spelling problems. In U. Frith (Ed.), *Cognitive processes in spelling* (pp. 495-515). London: Academic Press.
- Frith, U. (1985). Beneath the surface of developmental dyslexia. In K. E. Patterson, J. C. Marshall, & M. Coltheart (Eds.), *Surface dyslexia: Neuropsychological and cognitive studies of phonological reading* (pp. 301-330). Hillsdale, NJ: Lawrence Erlbaum.
- Gerber, P. J., & Reiff, H. B. (1992). *Speaking for themselves: Ethnographic interviews with adults with learning disabilities*. Ann Arbor: University of Michigan Press.
- Gerber, P. J., Ginsberg, R., & Reiff, H. B. (1992). Identifying alterable patterns in employment success for highly successful adults with learning disabilities. *Journal of Learning Disabilities*, 25, 475-487.

- Gittelman, R., & Feingold, I. (1983). Children with reading disorders: I. Efficacy of reading remediation. *Journal of Child Psychology and Psychiatry*, 24, 167-191.
- Gleitman, L. R., & Rozin, P. (1977). The structure and acquisition of reading: Relation between orthography and the structured language. In A. S. Reber & D. L. Scarborough (Eds.), *Toward a psychology of reading* (pp. 1-53). Hillsdale, NJ: Lawrence Erlbaum.
- Goodman, K. S. (1967). Reading: A psycholinguistic guessing game. *Journal of the Reading Specialist*, 6, 126-135.
- Gottesman, R., Bemont, I., & Kaminer, R. (1975). Admission and follow-up status of reading disabled children referred to a medical clinic. *Journal of Learning Disabilities*, 8, 642- 650.
- Gottesman, R. L. (1992). Literacy and adults with severe learning difficulties. *Journal of the National Association for Adults with Special Learning Needs (NAASLN)*, 2, 48-53.
- Gough, P. B. (1983). Context, form and interaction. In K. Rayner (Ed.), *Eye movements in reading: Perceptual and language processes* (pp. 203-211). San Diego, CA: Academic Press.
- Gough, P. B., & Hillinger, M. L. (1980). Learning to read: An unnatural act. *Bulletin of the Orton Society*, 30, 179-196.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7, 6-10.
- Gough, P. B., & Walsh, M. (1991). Chinese, Phoenicians, and the orthographic cipher of English. In S. Brady & D. Shankweiler (Eds.), *Phonological processes in literacy* (pp. 199-209). Hillsdale, NJ: Lawrence Erlbaum.
- Gross-Glenn, K., Jallad, B., Novoa, L., Helgren-Lempesis, V., & Lubs, H. A. (1990). Nonsense passage reading as a diagnostic aid in the study of adult familial dyslexia. *Reading and Writing: An Interdisciplinary Journal*, 2, 161- 173.
- Hallahan, D. P., & Kauffman, J. M. (1978). Categories, labels, behavioral characteristics: ED, LD, and EMR reconsidered. *Journal of Special Education*, 11, 139-147.
- Holt-Ochsner, L. K., & Manis, F. R. (1992). Automaticity training for dyslexics: An experimental study. *Annals of Dyslexia*, 42, 222-241.
- Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal*, 2, 127-160.
- Horn, C. C., & Manis, F. R. (1987). Development of automatic and speeded processing of word meaning. *Journal of Experimental Child Psychology*, 44, 92-108.
- Horn, W. F., O'Donnell, J. P., & Vitulano, L. D. (1983). Long-term follow-up studies of learning disabled persons. *Journal of Learning Disabilities*, 16, 542-555.
- Hurford, D. P. (1990). Training phonemic segmentationability with a phonemic discrimination intervention in second- and third-grade children with reading disabilities. *Journal of Learning Disabilities*, 23, 564-569.

- Jorm, A., & Share, D. (1983). Phonological recoding and reading acquisition. *Applied Psycholinguistics*, 4, 103-147.
- Jorm, A. F., Share, D. L., Maclean, R., & Matthews, R. (1986). Cognitive factors at school entry predictive of specific reading retardation and general reading backwardness: A research note. *Journal of Child Psychology and Psychiatry*, 27, 45-55.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, 80, 437-447.
- Juel, C., Griffith, P., & Gough, P. B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. *Journal of Educational Psychology*, 78, 243-255.
- Kean, M. L. (1984). The question of linguistic anomaly in developmental dyslexia. *Annals of Dyslexia*, 34, 138-151.
- Kirsch, I., & Guthrie, J. T. (1977-78). The concept and measurement of functional literacy. *Reading Research Quarterly*, 13, 485-507.
- Kitz, W. R., & Tarver, S. G. (1989). Comparison of dyslexic and nondyslexic adults on decoding and phoneme awareness tasks. *Annals of Dyslexia*, 39, 196-205.
- Lewkowicz, N. (1987). On the question of teaching decoding skills to older students. *Journal of Reading*, 31, 50-57.
- Lieberman, I. Y., Rubin, H., Duques, S., & Carlisle, J. (1985). Linguistic abilities and spelling proficiency in kindergartners and adult poor spellers. In D. Gray & J. Kavanagh (Eds.), *Biobehavioral measures of dyslexia* (pp. 163- 176). Parkton, MD: York Press.
- Lieberman, I. Y., Shankweiler, D., Camp, L., Blachman, B., & Werfelman, M. (1980) Steps toward literacy: A linguistic approach. In P. Levinson & C. Sloan (Eds.), *Auditory processing and language: Clinical and research perspectives*. New York: Grune & Stratton.
- Lieberman, I. Y., Shankweiler, D., Fischer, F. W., & Carter, B. (1974). Explicit syllable and phoneme segmentation in the young child. *Journal of Experimental Child Psychology*, 18, 201-212.
- Lieberman, I. Y., Shankweiler, D., & Liberman, A. M. (1989). The alphabetic principle and learning to read. In D. Shankweiler & I. Y. Liberman (Eds.), *Phonology and reading disability* (pp. 1-34). Ann Arbor, MI: University of Michigan Press.
- Lieberman, L. M. (1987). Is the learning disabled adult really necessary? *Journal of Learning Disabilities*, 20, 64.
- Lovett, M. W. (1987). A developmental approach to reading disability: Accuracy and speed criteria or normal and deficient reading skill. *Child Development*, 58, 234-260.
- Lovett, M. W. (1991). Reading, writing, and remediation; Perspectives on the dyslexic learning disability from remedial outcome data. *Learning and Individual Differences*, 3, 295-305.
- Lovett, M. W., Benson, N. J., & Olds, J. (1990). Individual difference predictors of treatment outcome in the remediation of specific learning disability. *Learning and Individual Differences*, 2, 287-314.

- Lovett, M. W., Warren-Chaplin, P. M., Ransby, M. J., & Borden, S. L. (1990). Training the word recognition skills of reading disabled children: Treatment and transfer effects. *Journal of Educational Psychology*, 82, 769-780.
- Lundberg, I., Frost, J., & Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly*, 23, 264-284.
- Malcolm, C. B., Polatajko, H. J., & Simons, J. (1990). A descriptive study of adults with suspected learning disabilities. *Journal of Learning Disabilities*, 23, 518-520.
- Mann, V. (1991). Are we taking too narrow a view of the conditions for development of phonological awareness? In S. A. Brady & D. P. Shankweiler (Eds.), *Phonological Processes in Literacy* (pp. 55-64). Hillsdale, NJ: Erlbaum.
- Mann, V. A., & Liberman, I. Y. (1984). Phonological awareness and verbal short-term memory. *Journal of Learning Disabilities*, 17, 592-599.
- McCall, R. B., Evahn, C., & Kratzer, L. (1992). *High school underachievers: What do they achieve as adults?* Newbury Park: Sage Publications.
- McCue, P. M., Shelley, C., & Goldstein, F. (1986). Intellectual, academic, and neuropsychological performance levels in learning disabled adults. *Journal of Learning Disabilities*, 19, 233-236.
- McGill-Franzen, A. (1987). Failure to learn to read: Formulating a policy problem. *Reading Research Quarterly*, 22, 475-490.
- Mercer, C. D., Hughes, C., & Mercer, A. R. (1985). Learning disabilities definitions used by state education departments. *Learning Disability Quarterly*, 8, 45-55.
- Miles, T. R. (1986). On the persistence of dyslexic difficulties into adulthood. In G. T. Pavlidis & D. F. Fisher (Eds.), *Dyslexia: Its neuropsychology and treatment* (pp. 149- 163). New York: John Wiley & Sons.
- Miller, G. A. (1988). The challenge of universal literacy. *Science*, 241, 1293-1299.
- Minskoff, E. H., Hawks, R., Steidle, E. F., & Hoffman, F. J. (1989). A homogeneous group of persons with learning disabilities: Adults with severe learning disabilities in vocational rehabilitation. *Journal of Learning Disabilities*, 22, 521-528.
- Moore, D., Hyde, A., Blair, K., & Weitzman, S. (1981). *Student classification and the right to read*. Chicago IL: Designs for Change.
- Morais, J., Cary, L., Alegria, J., & Bertelson, P. (1979). Does awareness of speech as a sequence of phones arise spontaneously? *Cognition*, 7, 323-331.
- Morice, R. & Slaghuis, W. (1985). Language performance and reading ability at 8 years of age. *Applied Psycholinguistics*, 6, 141-161.
- Morrison, F. J. (1987). The nature of reading disability: Toward an integrative framework. In S. J. Ceci (Ed.), *Handbook of cognitive, social, and neuropsychological aspects of learning disabilities* (pp. 33-62). Hillsdale NJ: Erlbaum.

- Mullins, I. V. S., & Jenkins, L. B. (1990). The reading report card, 1971-88: Trends from the nations report card. Washington, DC: U.S. Department of Education.
- Nagy, W. E., Herman, P. A., & Anderson, R. C. (1985). Learning words from context. *Reading Research Quarterly*, 20, 233-253.
- Naiden, N. (1976, February). Ratio of boys to girls among disabled readers. *Reading Teacher*, 439-442.
- Naylor, C. E., Felton, R. H., & Wood, F. B. (1990). Adult outcomes in developmental dyslexia. In G. T. Pavlidis (Ed.), *Perspectives in dyslexia* (pp. 213-227). Chichester, England: Wiley.
- Nelson, H. E. (1980). Analysis of spelling errors in normal and dyslexic children. In U. Frith (Ed.), *Cognitive processes in spelling* (pp. 475-493). London: Academic Press.
- Oka, E., & Paris, S. (1987). Patterns of motivation and reading skills in underachieving children. In S. Ceci (Ed.), *Handbook of cognitive, social, and neuropsychological aspects of learning disabilities* (pp. 115-145). Hillsdale NJ: Erlbaum.
- Olson, R. K., Wise, B., Conners, F., & Rack, J. (1990). Organization, heritability, and remediation of component word recognition and language skills in disabled readers. In T. Carr & B. A. Levy (Eds.), *Reading and its development: Component skills approaches* (pp. 261-322). New York: Academic Press.
- Orton, S. T. (1937). *Reading, writing and speech problems in children*. New York: Norton.
- Palincsar, A. S., & Brown, A. L. (1984). The reciprocal teaching of comprehension-fostering, and comprehension- monitoring activities. *Cognition and Instruction*, 1, 117-175.
- Palmer, J., MacLeod, C., Hunt, E., & Davidson, J. (1985). Information processing correlates of reading. *Journal of Memory and Language*, 24, 59.
- Pearson, P., Hansen, J., & Gordon, C. (1979). The effect of background knowledge on young children's comprehension of explicit and implicit information. *Journal of Reading Behavior*, 11, 201-209.
- Pennington, B. F., & Smith, S. D. (1991). Genetic influences on learning disabilities: an update. In D. D. Duane & D. B. Grady (Eds.), *The reading brain* (pp. 817-823). Parkton, MD: York.
- Pennington, B. F., Smith, S. D., Kimberling, W. J., Green, P. A., & Haith, M. (1987). Left-handedness and immune disorders in familial dyslexics. *Archives of Neurology*, 44, 634-639.
- Pennington, B. F., Van Orden, G. C., Smith, S. D., Green, P. A., & Haith, M. M. (1990). Phonological processing skills and deficits in adult dyslexics. *Child Development*, 91, 1753-78.
- Pennington, B. F., et al. (1986). Spelling errors in adults with a form of familial dyslexia. *Child Development*, 57, 1001-1013.
- Perfetti, C. A. (1985). *Reading ability*. New York: Oxford University Press.
- Perfetti, C., Beck, I., Bell, I., & Hughes, C. (1987). Phonemic knowledge and learning to read are reciprocal: A longitudinal study of first-grade children. *Merrill-Palmer Quarterly*, 33, 283-319.

- Perfetti, C. A., & Lesgold, A. M. (1977). Discourse comprehension and sources of individual differences. In M. A. Just & P. A. Carpenter (Ed.), *Cognitive processes in comprehension* (pp. 141-183). Hillsdale, NJ: Erlbaum.
- Posner, M. E. & Snyder, C. R. R. (1975). Attention and cognitive control. In R. Solso (Ed.), *Information and cognition: The Loyola symposium* (pp. 55-85). Hillsdale, NJ: Lawrence Erlbaum.
- Pratt, A., & Brady, S. (1988). Relation of phonological awareness to reading disability in children and adults. *Journal of Educational Psychology*, 80, 319-323.
- Rawson, M. (1968). *Developmental language disability: Adult accomplishments of dyslexic boys*. Baltimore, MD: Johns Hopkins University Press.
- Rayner, K., & Pollatsek, A. (1987). Eye movements in reading: A tutorial review. In M. Coltheart (Ed.), *Attention and performance XIII: The psychology of reading* (pp. 327-362). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Read, C., & Ruyter, L. (1985). Reading and spelling skills in adults of low literacy. *Remedial and Special Education*, 6, 43-52.
- Read, C., Zhang, Y., Nie, H., & Ding, B. (1986). The ability to manipulate speech sounds depends on knowing alphabetic writing. *Cognition*, 24, 31-44.
- Rivers, D., & Smith, T. E. C. (1988). Traditional eligibility criteria for identifying students as specific learning disabled. *Journal of Learning Disabilities*, 21, 642-643.
- Rodgers, B. (1983). The identification and prevalence of specific reading retardation. *British Journal of Educational Psychology*, 53, 369-373.
- Rogan, L. L., & Hartman, L. D. (1976). *A follow-up study of learning disabled children as adults*. Washington, DC: Bureau of Education for the Handicapped, U.S. Department HEW.
- Rogan, L. L., & Hartman, L. D. (1990). Adult outcome of learning disabled students ten years after initial follow-up. *Learning Disabilities Focus*, 5, 91-102.
- Roth, S. F., & Beck, I. L. (1987). Theoretical and instructional implications of the assessment of two microcomputer word recognition programs. *Reading Research Quarterly*, 22, 197-218.
- Rubin, H., Patterson, P. A., & Kantor, M. (1991). Morphological development and writing ability in children and adults. *Language, Speech and Hearing Services in Schools*, 22, 228-235.
- Rutter, M. (1978). Prevalence and types of dyslexia. In A. L. Benton & D. Pearl (Eds), *Dyslexia: An appraisal of current knowledge*. New York: Oxford University Press.
- Rutter, M., & Yule, W. (1975). The concept of specific reading retardation. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 16, 181-197.
- Scarborough, H. S. (1984). Continuity between childhood dyslexia and adult reading. *British Journal of Psychology*, 75, 329-348.
- Scarborough, H. S. (1989). Prediction of reading disability from familial and individual differences. *Journal of Educational Psychology*, 81, 101-108.

- Scarborough, H. S. (1991). Antecedents to reading disability: Preschool language development and literacy experiences of children from dyslexic families. *Reading and Writing*, 3, 219- 233.
- Seidenberg, M. S., & McClelland, J. L. (1989). A distributed, developmental model of word recognition and naming. *Psychological Review*, 96, 523-568.
- Shankweiler, D., & Crain, S. (1986). Language mechanisms and reading disorders: A modular approach. *Cognition*, 24, 136- 168.
- Share, D., Jorm, A., Maclean, R., & Matthews, R. (1984). Sources of individual differences in reading acquisition. *Journal of Educational Psychology*, 76, 1309-1324.
- Shaywitz, S. E., Escobar, M. D., Shaywitz, B. A., Fletcher, J. M., & Makuch, R. (1992). Evidence that dyslexia may represent the lower tail of a normal distribution of reading ability. *New England Journal of Medicine*, 326, 145-150.
- Shaywitz, S. E., Shaywitz, B. A., Fletcher, J. M., & Escobar, M. D. (1990). Prevalence of reading disability in boys and girls: Results of the Connecticut Longitudinal Study. *Journal of the American Medical Association*, 264, 998-1002.
- Siegel, L. S. (1989). IQ is irrelevant to the definition of learning disabilities. *Journal of Learning Disabilities*, 22(8), 469-479.
- Siegel, L. S. (1992, June). Talk delivered at Canadian Psychological Association, Quebec City.
- Siegel, L. S., & Ryan, E. B. (1984). Reading disability as a language disorder. *Remedial and Special Education*, 5, 28-33.
- Silver, A., & Hagin, R. (1985). Outcomes of learning disabilities in adolescence. In M. Sugar, A. Esman, J. Looney, A. Schwartzberg, & A. Sorosky (Eds.), *Adolescent Psychiatry: Developmental and clinical studies* Chicago: University of Chicago Press.
- Singer, M., & Crouse, J. (1981). The relationship of context- use skills to reading: A case for an alternative experimental logic. *Child Development*, 52, 1326-1329.
- Smith, F. (1971). *Understanding reading: A psycholinguistic analysis of reading and learning to read*. New York: Holt, Rinehart and Winston.
- Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. *Reading Research Quarterly*, 16, 32-71.
- Stanovich, K. E. (1984). The interactive-compensatory model of reading: A confluence of developmental, experimental, and educational psychology. *Remedial and Special Education*, 5, 11-19.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21, 360-407.
- Stanovich, K. E., Cunningham, A. E., & Cramer, B. B. (1984). Assessing phonological awareness in kindergarten children. *Journal of Experimental Child Psychology*, 38, 175-190.

- Stanovich, K., Cunningham, A. E., & Feeman, D. (1984). Intelligence, cognitive skills, and early reading progress. *Reading Research Quarterly*, 19, 278-303.
- Stanovich, K. E., & West, R. F. (1983). On priming by a sentence context. *Journal of Experimental Psychology: General*, 112, 1-36.
- Stedman, L. C., & Kaestle, C. F. (1987). Literacy and reading performance in the United States from 1880 to the present. *Reading Research Quarterly*, 22(1), 8-46.
- Sticht, T. G. (1972). Learning by listening. In J. Carroll & R. Freedle (Eds.), *Language comprehension and the acquisition of knowledge*. Washington, DC: Winston & Sons.
- Sticht, T. G. (1988). Adult literacy education. In E. Rothkopf (Ed.), *Review of research in education*. Washington, DC: American Educational Research Education.
- Sticht, T. G., Beck, L. J., Hauke, R. N., Kleiman, G. M., & James, J. H. (1974). Auding and reading: A developmental model (AF-HRL-TR-74-36). Air Force Human Resources Laboratory.
- Sticht, T. G., & James, J. H. (1984). Listening and reading. In P. D. Pearson, R. Barr, M. L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research*. New York: Longman.
- Taylor, H. G., Satz, P., & Friel, J. (1979). Developmental dyslexia in relation to other childhood reading disorders: Significance and clinical utility. *Reading Research Quarterly*, 15, 84-101.
- Temple, C. M. (1988). Developmental dyslexia and dysgraphia persistence into middle age. *Journal of Communication Disorders*, 21, 189-207.
- Test of Adult Literacy Skills (1990). New York: Simon & Schuster.
- Tunmer, W. E., & Hoover, W. A. (1992). Cognitive and linguistic factors in learning to read. In P. B. Gough, L. C. Ehri, & R. Treiman (Eds.), *Reading Acquisition* (pp. 175-214). Hillsdale, NJ: Lawrence Erlbaum.
- Tunmer, W. E., Nesdale, A. R., & Wright, A. D. (1987). Syntactic awareness and reading acquisition. *British Journal of Developmental Psychology*, 5, 25-34.
- van der Wissel, A., & Zegers, F. E. (1985). Reading retardation revisited. *British Journal of Developmental Psychology*, 3, 3-9.
- Vellutino, F., & Scanlon, D. M. (1987). Phonological coding, phonological awareness and reading ability: Evidence from a longitudinal and experimental study. *Merrill-Palmer Quarterly*, 33, 321-363.
- Venezky, R. L. (1976). *Theoretical and experimental base for teaching reading*. The Hague: Mouton.
- Venezky, R. L. (Summer, 1992). Matching literacy testing with social policy: What are the alternatives? NCAL Connections. Philadelphia: National Center on Adult Literacy, University of Pennsylvania.
- Venezky, R. L., Bristow, P., & Sabatini, J. (in press). Comparing basic skills and functional literacy tests for adult literacy assessment. Philadelphia: National Center on Adult Literacy, University of Pennsylvania.
- Vogel, S. (1974). Syntactic abilities in normal and dyslexic children. *Journal of Learning Disabilities*, 7, 103-109.

- Wagner, R., Balthazor, M., Hurley, S., Morgan, S., Rashotte, C., Shaner, R., Simmons, K., & Stage, S. (1987). The nature of prereaders phonological processing abilities. *Cognitive Development*, 2, 355-373.
- Wagner, R. K. (1988). Causal relations between the development of phonological processing abilities and the acquisition of reading skills: A meta-analysis. *Merrill- Palmer Quarterly*, 34, 261-279.
- Walberg, H. J., & Tsai, S. (1983). Matthew effects in education. *Matthew effects in education*, 20, 359-373.
- White, W. J. (1992). The postschool adjustment of persons with learning disabilities: Current status and future projections. *Journal of Learning Disabilities*, 25, 448-456.
- White, W. J., Alley, G., Deshler, D., Shumaker, J., Warner, M., & Clark, F. (1982). Are there learning disabilities after high school? *Exceptional Children*, 49, 273-74.
- Whitehouse, C. C. (1983). Token test performance by dyslexic adolescents. *Brain and Language*, 18, 224-235.
- Wise, B., et al. (1989). Implementing a long-term computerized remedial reading program with synthetic speech feedback: hardware, software, and realword issues. *Behavioral Research Methods Instrumentation Computing*, 21, 173-180.
- Wolf, M. (1991). Naming speed and reading: The contribution of the cognitive neurosciences. *Reading Research Quarterly*, 26, 123-141.
- Wolff, P. H., Michel, G. F., & Ovrut, M. (1990). Rate variables and autonomized naming in developmental dyslexia. *Brain and Language*, 39, 556-575.
- Yopp, H. K. (1988). The validity and reliability of phonemic awareness tests. *Reading Research Quarterly*, 23, 159-177.
- Ysseldyke, J. E., Algozzine, B., Shinn, M. R., & McGue, M. (1982). Similarities and differences between low achievers and students classified learning disabled. *Journal of Special Education*, 16, 73-85.
- Yule, W., Rutter, M., Berger, M., & Thompson, J. (1974). Over- and under-achievement in reading: Distribution in the general population. *British Journal of Educational Psychology*, 44, 1-12.